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The American Telephone Journal

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NUMBER 1

THE NATIONAL CONVENTION

THE full proceedings of the National Independent Telephone Convention are given in this number of the AMERICAN TELEPHONE JOURNAL. They will repay careful perusal, though the net results of the convention are not what they might have been. However, the disappointment in this respect is tempered by the fact that such a condition was anticipated. Under favorable circumstances there could have been no meeting in the United States which the public would have followed with much closer attention. That the proceedings fell somewhat flat is due not to any apathy in the industry, but to the mismanagement of the officers of the National Association to whom its affairs were intrusted. The Independent telephone movement is stronger to-day than ever before in its history, and its progress is amazing even to those who are most intimately connected with it. The Independents are increasing their lead over the Bell companies every month. At the present rate of progress, it is only a question of a short time when there will be twice as many Independent instruments in operation as there are Bell. In view of this, it is particularly trying that a gathering that should have accomplished so much, in reality accomplished so little. For all practical purposes the convention might as well not have been held. The recent convention of the Inter-State Association in Chicago accomplished more good in a day than the Philadelphia meeting accomplished in three days. This was due to the fact that the men who organized the Chicago convention, took their responsibilities seriously, and performed their duties conscientiously. The men at the head of the National Association, on the other hand, treated the whole affair as though the main object was a junket instead of a business meeting to which the Independent telephone companies of the country had a right to look for practical aid and guidance. The blame in the matter is undoubtedly on the shoulders of Judge Thomas. As president of the Association, he had it in his power to make this convention the most important ever held by the Independents. With energetic direction and a proper regard for the best interests of the men who have put their money in this important industry, he could, as chief executive officer, have produced results that would have had an important effect. Instead, he permitted the business of the association to drift, and the program mirrored very clearly the haphazard methods that have controlled.

Resentment against the course that has been pursued was very strong with the majority of the delegates who attended the convention. That there was no open manifestation of this resentment, was due entirely to the fact that Judge Thomas' friends conceded the situation. They asked a re-election of their candidate with the tacit agreement that he would retire towards the end of the summer when work for the coming year is to be laid out, and make way for a stronger man. It is the general understanding that Vice-President Dougherty will succeed to Judge Thomas's office. A better choice could not be made. Mr. Dougherty is strong, aggressive and forceful. He is a successful business man and has shown his great executive capacity. Better than this even, he has given the best sort of evidence of his ability to fight the Bell company with its own weapons. This means much to the Independents. There are plenty of people who would minimize the value of this qualification. But investigation will very generally demonstrate that these people are

outsiders, lacking knowledge of the true situation, or carried away by the force of affiliations which they cannot or will not overcome. The *Electrical World and Engineer* offers an excellent example of this class. Discussing the Philadelphia convention in its recent issue it declares:

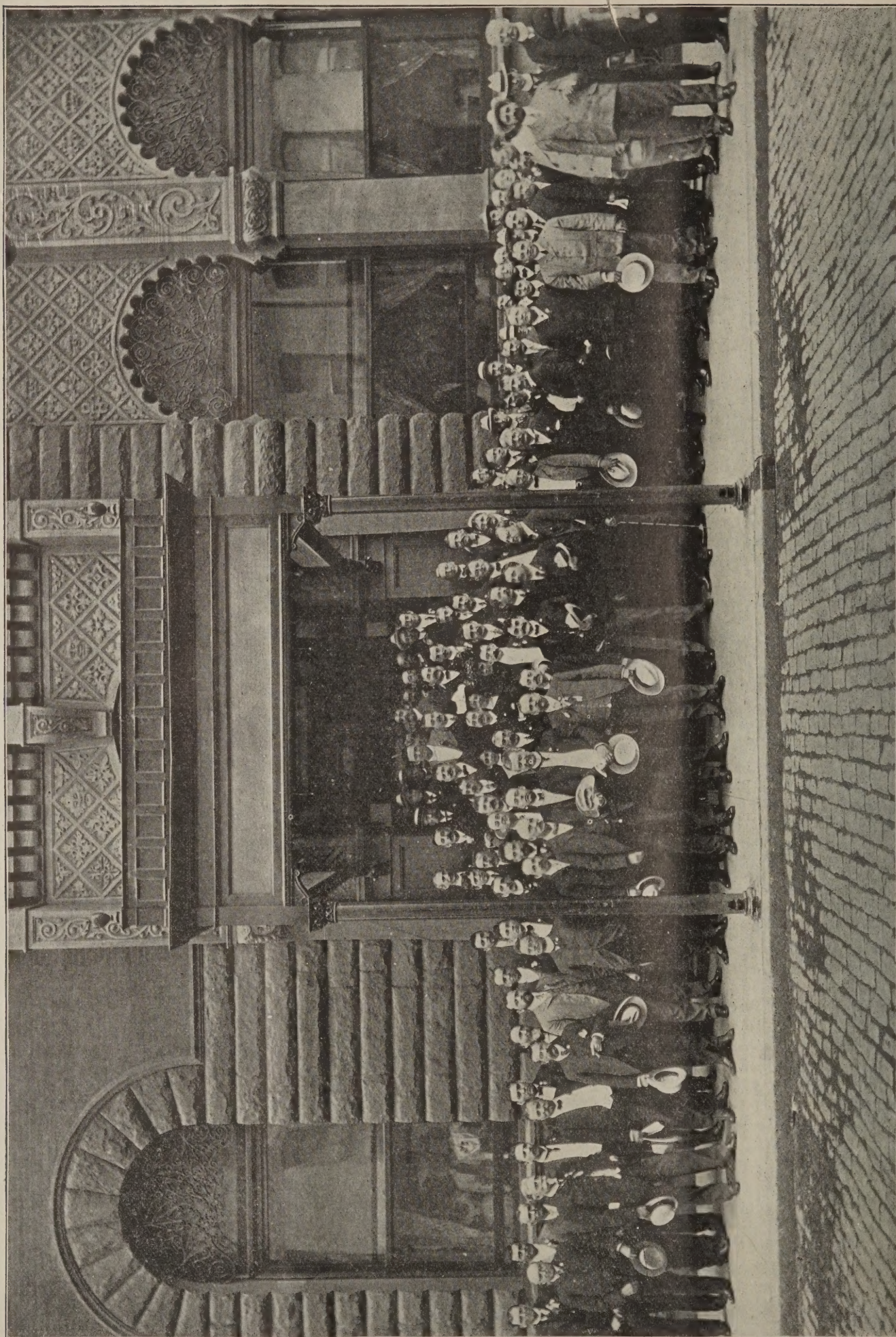
"There was again too much of the 'barbaric yawp' about Bell villainy and Bell tactics and the wiles of monopoly."

As a matter of fact, the National association can be engaged in no more useful occupation than combatting the "Bell villainy and Bell tactics and the wiles of monopoly," at which our contemporary sneers. These things are very real, as any practical operator in the Independent field with sufficient experience behind him to warrant his acceptance as an authority, will make clear. The parent Bell company has had for years and has today a highly organized system of scientific obstruction, to call it by no harsher term. Its tactics are worthy of the tactics of the Standard Oil Company during that organization's palmiest fighting days. If anything, the Bell people have improved upon the old Rockefeller system. The Standard Oil Company, where other means failed, found it convenient at times to blow up competing refineries. The Bell Company has far too much *finesse* for any such brutal practice. Instead, it conducts a literary bureau for the artful promulgation of matter calculated to injure the Independent movement. It maintains powerful representatives in all the great financial centers to hamper the newcomers in the telephone field when underwriting propositions are presented. It keeps in close communion with the law-making bodies of the land, and sees to it that it has "friends at court" in every State and municipality. Any number of cases could be cited to prove these statements.

An illuminating instance is to be found every week in the columns of the *Electrical World and Engineer*, where the Bell Company has a standing advertisement, the sole object of which is to intimidate. When the Bell people no longer seek to throttle competition by such improper methods, and conduct their affairs in a legitimate manner, the arguments of their friends and advocates will have some force. Until then, it will be pretty difficult to accept pleasantly the sort of competition that emanates from Boston. The people who are compelled to meet this competition feel that the "wiles of monopoly" are too substantial to be disposed of in a sarcastic paragraph.

True, "yawping" at them is very unsatisfactory. The thing to do is to fight the devil with fire. This is peculiarly the province of the National Association and under the forceful administration such as Mr. Dougherty would no doubt give something besides "yawping" might be accomplished. As a preliminary, it would be an excellent thing if there was a merging of the National with the Inter-State Association. This would concentrate the management and make the work of both organizations more effective.

With the passing of Judge Thomas, an excellent start will have been made towards this desirable end. The choice of a secretary by the National Convention in the person of Mr. Ware was wholly excellent, and with Mr. Dougherty as the head of the organization the Independents would have a set of officers on whom they could rely for practical results.



DELEGATES TO THE NATIONAL INDEPENDENT TELEPHONE CONVENTION, PHILADELPHIA, JUNE, 1902.

PROCEEDINGS OF THE NATIONAL CONVENTION

IN the last issue of THE AMERICAN TELEPHONE JOURNAL there was a short account of the proceedings of the Sixth Annual Convention of the Independent Telephone Association of the United States of America. In this issue a complete report is appended.

TUESDAY MORNING.

The convention was called to order by President James M. Thomas at 10 a. m. Robert H. Foerderer, president of the Keystone Telephone Company of Philadelphia, introduced Mayor Samuel H. Ashbridge in a few well-chosen words. In welcoming the delegates to Philadelphia the Mayor said:

Mr. Chairman and Gentlemen: I do not presume that Mr. Foerderer had any ulterior motive in making an unkind reference to something which I did some two years ago, and which has practically brought down upon my head, from that day to the present time, a very great deal not only of criticism, but of abuse, in introducing to Philadelphia an Independent telephone corporation, destined to give better service, and more efficient service, at better rates, than had previously existed.

It has, however, had one result: Better service is obtainable now from the other company, and very much cheaper rates are given subscribers than ever would have been made if there had not been competition.

I am a great believer in competition in all things, and in that belief I signed the so-called "Keystone Telephone Bill," for which, in the parlance of the railroad man, I have had the "red board" against me ever since. But it matters little, if one feels that he is doing his duty and is benefiting the community by ensuring better service at cheaper rates; and anything that will materially benefit a community or a people or a business, I count it the duty of those in authority to carry out and execute.

I, therefore, have no apologies to express for signing a bill giving to the people of this city a franchise through a company that has become such a factor in the commercial life of the city.

Telephones are no longer experimental, but are practically useful things that enter into the daily life of all people, in all conditions of life—the physician and the lawyer, the merchant and the manufacturer; and into the home life—our domestic world—it enters so largely that we welcome all competition that has a tendency to extend its usefulness.

I am quite sure that I am glad to be here to-day to welcome you—men of the Independent telephone business—who have had the moral courage and the intellectual development to risk your money in a business in competition with a great monopoly.

I trust your assembly and convention, to-day and in the days that follow, may be fruitful and beneficial, in the still further development of Independent telephone growth, and that you may prove a protection and benefit to every community in which your companies are organized and work.

We are glad, at all times, in Philadelphia, to meet people from other States and other localities, and to exchange with them the best that we and they have for the commercial interest and the development of our country. This city is noted for its hospitality, its liberality, its cordial greetings to all people, its humanitarianism, the morality of the community, the intelligence of its people, and all qualities that have made this country great and honored as it is. We claim, with a very great deal of pride, that the high intelligence of our people and the development of the genius of our people, through our splendid educational institutions, have helped to make this country honored and distinguished all over the world.

We are glad, indeed, let me repeat, to have you here in our midst, that you may commune and exchange thoughts and ideas with those connected with our organizations in this city—whether it be in telephones or other directions—and so increase the commercial benefit and foster the manufacturing genius of our nation. The age is one of progress—onward, constant, upward—and we welcome all people, even those who come in active competition with us, who are interested in the great things that benefit the whole community.

You are to be commended for your moral courage in entering into competition with what was one of the great monopolies that held this country by the throat, so that no one else dared to enter into the territory forbidden by its edicts. "In union there is strength," and by your combination and organization you have

been able to successfully combat those people who tried to crush you out of existence.

I am not antagonistic to the Bell company; on the contrary, I have warm personal relations with many of the officers of the company, whom I esteem very highly, as men. But this country is too great, and the interests of its people are too great, for one man, or one interest, or one concern, to monopolize any one good thing.

I hope your sessions may be fruitful and beneficial, and that when you return to your homes it may be with pleasant thoughts and recollections of the hospitality of the city of Philadelphia. A great many conventions come here, and many bring ladies. I wish to say—without speaking disparagingly of the cities from which you have come—that so perfect are our police regulations in this city that the ladies—our mothers, wives, sisters and daughters—can traverse every portion of the city without any fear of molestation.

We have many things here to show you, and I have no doubt the local committee will show to you many points of interest—our historical buildings (from whence this country sprang), our parks, our suburbs, and many points that will be a pleasure to you. If you are not able to see them all, I hope that you may be able to do so at some future time, when you visit the city for other purposes than that of holding a telephone convention and stimulating the gentlemen who are interested in the local company, which has the best telephone plant and the best underground conduit system on the American continent. The hazardous risk of a difficult business has been taken by these gentlemen on a large scale, and, from the manner in which they are conducting their service, it will probably be many years before they will see much profit.

You may read in our newspapers, while you are here, how trees have been uprooted, streets torn up, and all that sort of thing. Well, treat it all as it deserves to be treated—that it is written for a purpose. I presume that the words I say now may be taken down, and you need not be surprised if scare headlines greet you to-morrow morning in some of the journals of this great city. I believe in American liberty, in freedom of thought and freedom of speech—but yielding not to any man the keeping of my conscience.

Again I welcome you, gentlemen, cordially and heartily, to the "City of Brotherly Love"—beneficial, patriotic, loyal and devoted to country and to union—always ready to give a helping hand to every honest man of whatsoever vocation in life.

Secretary Sheerin, in behalf of the convention, responded as follows to the hearty welcome of the Mayor:

Mr. Mayor: On behalf of the Independent Telephone Association of the United States, I thank you for your most cordial welcome to this "City of Brotherly Love."

Our organization, and the interests for which we stand, are represented in every State in the Union. Our people are about up to the average of American citizenship in morality and intelligence.

We are very much above the average in our fighting qualities. This, Mr. Mayor, is not because we were naturally better fighters than other people, but because—like the fathers who signed the Declaration of Independence in this good city more than a century and a quarter ago—our opportunities for fighting have been excellent.

We are, one and all, anti-monopolists. This is not only a principle with us, but a business and a pursuit as well. We, however, ask nothing that we are not willing to give.

We come nearer to the hearts and homes of the people than any other public utility. The good housewife who only patronizes a railroad or a steamboat once in a year wants to talk several times a day. We facilitate conversation, aid the dispatch of business, and help the protection of life and property.

When we were invited to come to Philadelphia, we agreed, as one man, to come. We believe, Mr. Mayor, that every one should come, for inspiration at least, once in a lifetime to the "cradle of liberty."

We will try to deport ourselves as becometh good citizens while we stay. Our president, of course, will instruct the delegates that the freedom of the city, which you have so generously offered, does not mean freedom to walk off with the "Liberty Bell," or with any other "belle," without the consent of the proper parties.

We know that we shall find many things here to interest us. We feel entirely satisfied that we shall carry away with us many pleasant memories of Philadelphia and her people. Our sincere hope is that we may be able to leave behind us pleasant memories of ourselves.

Following Secretary Sheerin's response to the welcome of Mayor Ashbridge, President J. M. Thomas delivered the annual address to the convention.

PRESIDENT THOMAS' ADDRESS.

Gentlemen of the Convention: In the annual report of the president of the American Telephone and Telegraph Company, under date of December 31, 1901, page 8, we find the following:

"Competition from telephone companies not associated with this company has existed for several years, and is likely to continue in some places for some time to come. While it has in some places affected the licensees of this company disadvantageously, by reducing, for a time at least, the number of their subscribers, and forcing them to meet competitive rates that are not based upon a proper recognition of the cost of doing business or an adequate appreciation of the amount that should be set aside from the earnings for maintenance, reconstruction and depreciation, the consequences of the competition to the business as a whole have not been of serious moment. The public in each community will determine for itself whether it is for its advantage that there should be two telephone exchanges serving one body of people. It would seem as if but one conclusion on this point was possible."

We believe a little closer examination of the subject would have caused the report to say that these low rates are made in the hope of destroying competition. In almost every instance, instead of meeting competitive rates, they have offered ruinous rates, and so far have failed to destroy competition. So that the public so far has not determined whether there shall be two exchanges, except in some instances where the patronage has been withdrawn from the Bell Exchange and the same has been closed. The public desires that competition exist in all lines of business, but we do not believe in ruinous competitive rates. And we do not believe as a general rule that Independent rates, as they have been established by the majority of companies, are too low. On the other hand, they show good business profit.

We agree with Mr. Fish's statements that "Competition has existed for several years, and is likely to continue in some places for some time to come, and has affected the licensee companies disadvantageously." We also agree with his statement that the consequences of competition to the business as a whole have not been of serious moment. On the other hand, we believe most sincerely that competition has done more for the telephone business than was accomplished in the entire period before competition entered the field, and I cite you as a proof of that fact the last annual report of the president of the American Telephone and Telegraph Company. The growth of the business since that time has been marvelous, while the character of service has been greatly improved.

Our object in this address shall be to frankly, fairly and broadly present the telephone business as it exists to-day, to insist upon rights, to discover wrongs, and, if possible, to be of some service to the many interests throughout the country; to point out a way of eliminating dangers to capital, which come through mistaken promotion and ruinous rates. We know that capital is needed to carry on this great enterprise which has had such great impetus through competition. We desire to assure capital that, with proper precautions, there is no safer investment. We shall, therefore, begin with rules governing real estate investments and try to apply them to this business as a guide to safe, permanent investment.

The architect who plans well knows every detail of the structure necessary for permanency and harmony before handing the drawings and specifications to the builder. It is quite necessary that the builder fully comprehend the plans and know every detail of structure as conceived by the architect, and apply to this his own knowledge of how to build well without waste. These two men are essential to the interests of the capitalist who seeks a permanent investment.

But before the architect is selected, it is very essential that the land be purchased at a fair, reasonable price, therefore good judgment must be used in the selection of the agent to make the purchase. Then, too, the capitalist must have money enough to fully complete his new property without subjecting himself to usurious charges. With all these essentials properly com-

bined, the new enterprise is a good business venture from every standpoint.

It pays the capitalist because it is a good investment; the agent, architect and builder, because it not only pays well for present labor, but as they have proven competent and faithful, provides new employment in the future. This view of making good permanent investments in real estate, however, applies only to the older communities. It does not suit in all its details the pioneer, for he in his new country desires only to take care of his present wants, until he can determine the kind of structure most valuable as a permanent investment.

The building of telephone properties has not been known to man very many years. It is fast passing out of the pioneer stage, though no telephone property has ever yet been completed. But now men who are giving close study to this great and important business believe that the time has come when we should look to the essentials from the investment standpoint.

This business requires more capital than is to-day at the command of the people who are at work in the building up of telephone properties, a stage that is always reached in the building up of great enterprises.

Like all who work in a common interest, we should, in view of this fact, give earnest consideration to the best means of relieving the situation. We have in our meeting to-day men enough to invest during the present year more than was invested the first ten years of the use of the telephone. Local telephone investments are at present limited to the influence of the crowd which undertakes the enterprise, retarded by all other influences that are seeking money for investment in other enterprises, plus the influence of the Bell Company working through many of the financial institutions of the country.

The general money markets have not yet been opened up to the business. Large enterprises have been compelled to pay heavy tribute to the underwriter. There are some instances where the underwriters' profits have very greatly embarrassed the enterprise, and others where this is sure to come in time.

If we have reached the period of building permanent investments, which we believe we have, then we must consider the best ways and means of building so as to be attractive to capital.

The thing itself is necessary to the present methods of social and business economy.

It takes uttered sounds—God's method of conveying intelligence—and sends it over long distances, so that it is no longer essential that parties who desire to talk shall be compelled to pick up their cumbersome bodies and carry them at great expense. When men no longer talk, then the telephone will be placed in museums with the mummy and other dead things; and capital should remember that woman will use it even after man has quit talking. You know she always has the last word.

If the thing itself is of a permanent nature, like good building ground, by employing the proper agent, architect, builder and operator, the telephone investor will have a desirable permanent investment, such as is not only sought in local but in general money markets. The capitalist is always ready to invest in something sure and permanent, even though the returns are not very large.

Suppose we walk along together and make a very close examination to see if we can discover the reason or reasons, as the case may be, why sufficient capital has not invested in a business with every promise of permanency; especially since it has become a necessity, with an unlimited demand. If permanent necessities, so much in demand that the people cannot be supplied promptly, does not return to capital its just reward, then there is something wrong with the management of the business. As we are going upon a search of this kind, suppose we begin at the beginning, which, in this case, is with the inventor.

Of course, we cannot look into every detail, or consider disputed rights among inventors. We start here simply after looking at an invention which is not surpassed in point of profound discovery and great use since the beginning of the age of man. If we had comprehended its great value at the time of its discovery, as we now do, capital would have undertaken to place it in the hands of the people in a way that would have spread its use more rapidly and more economically than was done in its earlier stages of development. But as all men are made of mud, and slow of comprehension, we must, as with everything else, take its slow stages of development as disclosing its weak and strong points.

Some very selfish contracts were made which aimed to be per-

petual and exclusive. Through all the different stages of the growth of the American "Bell" organization and the preceding organizations, we find the work of the skilful hand of monopoly. These contracts demand unreasonable tribute to the small capital which represented the parent company. It was the working out of a scheme which demanded, for a small number of people with a small amount of capital, unreasonable tribute from a large number of people representing a large amount of capital.

The capitalist knows that in all instances the real capital invested is not represented by the amount of capital stock issued, and not always by the showing on the property ledger. He also knows that a prospectus has never gained the standard given our good book, the Bible. He understands the ways and wiles of the promoter, and knows the rosy hue may be a little water-color, which the first dampening effect will destroy.

While we stop to differentiate, we must not forget that all so-called capitalists are not real capitalists, and that all so-called promoters are not real promoters. The one who is not a promoter will do anything for money, and the one who is not a capitalist will steal all your time without compensation. Both should be avoided by those who would succeed. The would-be capitalist and the should-not-be promoter should always be placed together.

In this consideration, we should always bear in mind that the agent, architect, builder, operator and capitalist are essential to good business investments of great value to a community. If overcapitalization through promoters' profits and the payment of tribute are reasons for the hesitation of capital to invest, let us seek some way to eliminate it. If competition has made ruinous rates, let us find some way to restore them.

If the people are to have the benefit of reasonable rates, and the capitalist a fair return on his investment, the individual and the municipal, county and state organizations must not be selfish and unfair. The present tendency to hold the corporation up does not benefit the people, and is not pleasing to capital; it is a dangerous weed which seems just now to flourish.

We find, upon a careful study, many difficulties. We believe no other business presents quite as many. We find, through the slow stages of development, a long period of pioneering that has cost a great deal of money, which practically has had to be replaced by installing more efficient apparatus and construction every few years. So that the capital invested has grown to very large proportions; while much more capital is necessary to be placed in the business in order to take care of the demand for service within the next year or so.

We should bear in mind that through this pioneering we have educated the people to use the telephone, and that they are educated for all time in this method of communication. That while this has been accomplished, we have also been educating agents, architects, builders and operators to handle the business more economically; and the inventors are constantly giving us new facilities for more economically handling the business. There is no excuse now for poor construction, inferior apparatus, ruinous rates, overcapitalization, incompetent employees, or any other thing that would bring danger to the investor. All we now need is frankly to confess our errors in the past, and to proceed as business men in all lines proceed, to take care of the capital invested in the business, using modern methods and economies in working out our plans. Let us recognize one another's rights, and work in harmony to one common end, to place the business upon a firm financial footing.

The Independent Telephone Association has from its birth taken the stand of recognizing every man's rights. And the work of the officers and committees of the association has always been free from prejudice or preference, and has been conducted upon broad and just principles. The banner of this association has never been trailed in the dust.

We feel than on account of the standing that this association has gained as the representative of the Independent telephone companies of the United States, that it must be the advanced thinker and the advanced worker in this field; that its policy should be ever onward to work out difficult telephone propositions on lines that will be both pleasing to capital and to the people. That its object should not be to destroy, but to build up. That it should not be governed by prejudice or preference, but by justice and fair dealing. We hope and believe that this will be its future course.

This concluded the business for the day. The convention adjourned until Wednesday at 10 o'clock. At 2 o'clock came one

of the most enjoyable features of the meeting. Ten large tally-hos drove up to the Walton, and the delegates were taken on a trip up the Wissahickon. After the city proper was passed through, the party was driven through Fairmount Park, along the Schuylkill, and then along the Wissahickon Creek on the splendid driveway bearing that name, and finally stopped at Indian Rock Hotel. Refreshments were had here, and the return trip was begun, the party arriving at the hotel about 6 o'clock p. m.

WEDNESDAY'S SESSION.

Wednesday morning, the convention was not called to order until after 11 o'clock, most of the delegates being at the Keystone Building, inspecting the various exhibits.

President Thomas introduced Prof. W. Elwell Goldsborough, of Purdue University. Prof. Goldsborough is the head of the course of electricity at Purdue, and at present at St. Louis in charge of the electrical exhibits of the forthcoming Louisiana Purchase Exposition. He was the bearer of an invitation to the Independent Telephone Association from the Business Men's League of St. Louis, to hold their seventh annual convention in St. Louis. The exposition, he said, would then be in full blast, and he thought St. Louis would be the best place to hold the convention, and, besides, the delegates would have an opportunity to see the exposition at the same time.

Prof. Goldsborough said the exposition would be on a grander scale than any exhibition ever before held. The commissioners have a total of over \$30,000,000 promised for this exposition on which no return has to be made. He hoped the Independent telephone interests would make a good showing at the exposition.

A resolution was offered heartily endorsing the St. Louis Exposition and thanking Prof. Goldsborough and the Business Men's League of St. Louis for their invitation.

W. A. Foss, of Cleveland, objected to this. He said when the last convention met in Buffalo the delegates devoted their time to the exposition, and nothing could be accomplished by the convention. It was explained to him that the resolution did not accept the invitation, but was simply a resolution of thanks. The resolution was carried.

Mr. D. H. Critchfield then moved that only one session of the convention be held that day, as he had been unable to prepare the paper "The Financial Status of the Independent Telephone Movement," for which he was on the program, and that Mr. Nathl. N. Spofford, on account of illness in his family, could not be present at the convention and read his paper, "How They and We Do Things in Massachusetts."

This motion was seconded and carried. Mr. L. A. Goudy, president of the Northeastern Telephone Company, of Portland, Me., was then introduced, and read an interesting paper on "The Telephone Situation in the Northeast," which we preent on another page.

He was succeeded by Mr. E. E. Webster, who read a paper on the "Telephone Situation in the Northwest." This paper was prepared by Mr. C. H. Judson, of the Twin City Telephone Company, of Minneapolis, who was unable to attend the convention.

Time was then allowed for discussion of these papers. After a few remarks and questions the general conclusion was reached that both papers were so complete that nothing further need be said.

Mr. L. W. Stanton, of the Federal Telephone Company, of Cleveland, although not down for a paper, was requested to prepare one on "Tariff, Traffic and Equipment" for the next day. Mr. Stanton, it will be remembered, won the first prize of \$50 in the prize story contest of the AMERICAN TELEPHONE JOURNAL, his article being printed in the convention number.

The convention then adjourned to meet Thursday at 10 a. m.

THURSDAY'S SESSION.

Thursday morning, Mr. Thomas Martindale, chairman of the Trades League of Philadelphia, addressed the convention briefly on request. He spoke in favor of establishing telephone newspapers such as are in use in many countries of Europe. His plan, briefly, is to have a daily resume of the news, stock reports, quotations, etc., read from exchanges operating in rural communities. Each item of news will be read at a certain prescribed time, so that if a farmer, for instance, wishes to know what hogs or potatoes or corn are selling for, he can simply take his receiver off the hook at the time these items are read; and, hearing them, can again hang up.

A vote of thanks was tendered Mr. Martindale by the convention.

Secretary Sheerin read the paper prepared by Hon. L. J. Hackney, of Indianapolis, on "Where We Were and Where We Are," Mr. Hackney being unable to attend. It will be found in another page of this issue.

Mrs. Annie McElroy Brett, of El Paso, Tex., was requested to address the convention in the absence of Mr. Z. D. Campbell, of San Antonio, Tex., who was down for a paper on "The Independent Telephone Situation in the Southwest," and told what she had accomplished in the Independent field in Texas. When she went into Texas, she said, the people thought the Bell was the only company. They didn't believe any one else could operate an exchange. They had to be educated, and now, after a long fierce fight, the Independents have practically captured Texas and driven the Bell interests out.

Mr. L. W. Stanton then read a paper he had prepared on "Needed Improvements in Independent Telephony."

Secretary Sheerin then moved a vote of thanks to the local committee, to the Keystone Telephone Co., Mayor Ashbridge and the people of Philadelphia for their courtesy to the Independents' convention. This was unanimously adopted.

Mr. Critchfield requested that his paper on "The Financial Status of the Independent Telephone Movement," which he had been unable to prepare in time to be read, be printed in the record of the association. Request granted.

Secretary Sheerin requested some one to move an auditing committee to audit the books and accounts of the treasurer, which was agreed to. The committee was not announced, as they will be selected in as close proximity to Mr. Sheerin's home as possible. He then announced that for four years he had continuously served as secretary and treasurer of the association. He had had enough honor, and would like to give some one else a chance, and positively declined to again serve.

Before adjournment the following important resolution was adopted:

"Whereas, it is generally believed and currently reported through the Press of the United States and otherwise that a combination exists among dealers in electrical supplies, the purpose and object of such combination among others being to unlawfully increase prices of such supplies from 25 to 50 per cent; to limit the production of such materials; to unlawfully discriminate in favor of certain purchasers of such supplies, and to boycott or cause to be boycotted buyers or dealers who are not affiliated with such association or combine; and

"Whereas, such organization in effect amounts to a conspiracy which unlawfully and injuriously effects general trade in such supplies, and is especially injurious in its effects to purchasers of apparatus for Independent telephone properties; now, therefore be it resolved that the president and secretary of this association be and are hereby directed to advise the Attorney General of the United States of the nature and methods of doing business practiced by said organization or combine, and to request the Attorney General of the United States to cause an investigation to be made of the methods of said combination or association, and to tender the assistance of this association, if desired, in making said investigation, and if found to be in violation of law to request the Attorney General of the United States to commence action and prosecute the same to a conclusion with a view of preventing and terminating such unlawful business methods.

At two o'clock the convention was called to order with Mr. H. C. Young in the chair. He appointed the following committee to nominate the officers and advisory board for the ensuing year: H. D. Critchfield, Cleveland; L. A. Goudy, Portland, Me.; E. E. Webster, Minneapolis; C. L. Ingham, Buffalo; F. W. Schirmeyer, Decatur, Ind.; R. F. Johnson, Saginaw, Mich., and G. B. Rudy, York, Pa.

They presented the following ticket:

For president, James M. Thomas, Cleveland; first vice-president, Hugh Dougherty, Bluffton, Ind.; second vice-president, C. E. Stinson, Rochester, N. Y.; third vice-president, W. H. Durin, Cedar Rapids, Iowa; secretary and treasurer, J. B. Ware, Detroit, Mich.; first assistant secretary, C. E. Wilson, Philadelphia; second assistant secretary, E. L. Barber, Wauseon, Ohio; third assistant secretary, T. B. Lee, Pittsburgh, Pa.

On motion of Mr. Critchfield the convention cast its vote unanimously for these officers.

The advisory board elected is as follows: James M. Thomas,

H. D. Critchfield, E. B. Fisher, Samuel E. Wayland, S. P. Sheerin, H. C. Young and E. E. Webster.

The following members were named as the executive committee: Illinois, Geo. W. Fair, chairman; Indiana, Geo. F. Trier, Fort Wayne; Iowa, A. T. Pressen, Iowa City; Kansas, C. E. Wells, Marion; Kentucky, J. A. Armstrong, Louisville; Louisiana, L. H. Lancaster, Thibodaux; Michigan, R. F. Johnson, Saginaw; New Jersey, John J. Burleigh, Camden; New York, C. L. Ingham, Buffalo; Ohio, F. L. Beam, Columbus; Maine, Lewis A. Goudy, Portland; Massachusetts, Vinton A. Sears, Boston; Missouri, H. L. Reber, St. Louis; Pennsylvania, C. W. Kline, Hazleton; Minnesota, C. H. Judson, Minneapolis; Texas, Mrs. Annie McElroy Brett, El Paso; Virginia, R. F. Hogsett, Wellsburg, W. Va.; West Virginia, W. K. Cummings, Wellsburg; Wisconsin, I. H. Moulton, Le Crosse.

Before final adjournment, the secretary announced the financial standing of the Association as follows:

Total receipts from June 7, 1901, to June 21, 1902, \$1,973.70; disbursements, \$1,943.20, leaving a balance on June 21, of \$30.50. Received at the Philadelphia convention, \$184.10 as dues, which makes the total cash on hand, \$214.60.

The convention was adjourned at 2:20. A special train left Philadelphia at 3 o'clock for Atlantic City, where the delegates and visitors were entertained at the Hotel Dunlop.

OPERATING TELEPHONE MEN AT THE CONVENTION.

J. A. Armstrong, Home Telephone Co., Louisville, Ky.
E. A. Armstrong, Eastern Tel. and Tel. Co., Camden, N. J.
C. E. Austin, Frontier Telephone Co., Buffalo, N. Y.
R. L. Andrews, Farmington Valley Telephone Co., New Britain, Conn.
Harry J. Arnold, Eastern Electric Construction Co., Philadelphia, Pa.
A. A. Anderson, Pittsburg, Pa.
G. H. Atkinson, State Telephone Co., of New Jersey, Jersey City, N. J.
Geo. W. Beers, National Tel. & Tel. Co., Fort Wayne, Ind.
J. J. Burleigh, Eastern Tel. & Tel. Co., Camden, N. J.
Ed. L. Barber, Central Construction Co., Wauseon, Ohio.
Mrs. A. M. Brett, Southern Independent Tel. & Tel. Co., El Paso, Tex.
James Breen, Keystone Telephone Co., Philadelphia, Pa.
Edward Burke, Electrical Bureau, Philadelphia, Pa.
E. H. Bouton, Maryland Tel. & Tel. Co., Baltimore, Md.
W. T. Block, United Tel. & Tel. Electric Co., Chicago, Ill.
R. F. Broussard, The Telephone Co. of America, New Iberia, La.
W. H. Bryant, Home Telephone Co., Mobile, Ala.
W. H. Butler, Kent Home Telephone Co., Kent, Ohio.
A. E. Bainbridge, Philadelphia, Pa.
W. D. Barnard, United Tel. & Tel. Co., Philadelphia, Pa.
J. F. W. Blizzard, Philadelphia, Pa.
L. D. Beylard, New York, N. Y.
G. S. W. Brubaker, Standard Tel. & Tel. Co., Philadelphia, Pa.
F. L. Beam, Citizens' Telephone Co., Columbus, Ohio.
Jas. S. Brailey, Jr., Central Construction Co., Toledo, Ohio.
Chas. A. Brown, Chicago, Ill.
H. D. Critchfield, Federal Telephone Co., Cleveland, Ohio.
W. K. Cummings, Wellsburg, W. Va.
W. H. Clark, Keystone Telephone Co., Philadelphia, Pa.
J. J. Conner, Maryland Tel. & Tel. Co., Baltimore, Md.
J. C. Crowley, Maryland Tel. & Tel. Co., Baltimore, Md.
R. F. Case, Farmington Valley Telephone Co., New Britain, Conn.
P. L. Clark, Bristol, Conn.
W. H. Carter, Hampton, Va.
L. H. Cohen, Philadelphia, Pa.
H. M. Coulter, Chicago, Ill.
W. H. Durin, Cedar Rapids, Iowa.
Hugh Dougherty, United Telephone Co., Bluffton, Ind.
F. A. Demorest, Interstate Telephone Co., Trenton, N. J.
Fred De Land, Kansas Long Distance Tel. & Tel. Co., Topeka, Kan.
G. S. Du Perow, Federal Telephone Co., Cleveland, Ohio.
L. Duncan, Keystone Telephone Co., Philadelphia, Pa.
Ed Davis, Binghamton Tel. & Tel. Co., Binghamton, N. Y.
F. H. Dyckman, New York, N. Y.
M. B. Davis, Baltimore, Md.
R. M. Eaton, Keystone Tel. Co., Philadelphia, Pa.
W. C. Erwin, Burke County Tel. Co., Morganton, N. C.
P. J. Eubanks, Harrison Construction Co., Cincinnati, Ohio.
E. B. Fisher, Citizens Telephone Co., Grand Rapids, Mich.
G. W. Fair, Chrisman, Ill.
E. A. Frazee, Home Telephone Co., Connersville, Ind.
R. H. Foerderer, Keystone Telephone Co., Philadelphia, Pa.
H. W. Fox, Long Distance Telephone Co., Indianapolis, Ind.
Geo. R. Fuller, Rochester Telephone Co., Rochester, N. Y.
T. Fesser, Keystone Telephone Co., Philadelphia, Pa.
W. A. Foss, American Toll Telephone Co., Cleveland, Ohio.
S. M. Granger, Zanesville Tel. & Tel. Co., Zanesville, Ohio.

I. H. Griswold, American Construction and Trading Co., Elyria, Ohio.
 L. A. Goudy, Northeastern Telephone Co., Portland, Me.
 B. C. Groh, Interstate Telephone Co., Trenton, N. J.
 A. Glass, Home Telephone Co., Mobile, Ala.
 Wm. Geckler, Camden, N. J.
 R. F. Hogsett, Wellsburg, W. Va.
 H. A. Harvey, United Tel. & Tel. Co., Chicago, Ill.
 F. Herboth, Keystone Telephone Co., Philadelphia, Pa.
 W. L. Hodges, Keystone Telephone Co., Philadelphia, Pa.
 C. Keely Hagy, Keystone Telephone Co., Philadelphia, Pa.
 J. E. Hughes, Phoenixville, Pa.
 W. E. Hitchcock, Delaware and Madison Co. Telephone Co., Muncie, Ind.
 C. L. Ingham, Frontier Telephone Co., Buffalo, N. Y.
 R. F. Johnson, Valley Telephone Co., Saginaw, Mich.
 H. W. Johnson, Columbia Telephone Co., Columbia, Pa.
 Jos. Jermyn, Syracuse, N. Y.
 C. W. Kline, United Tel. & Tel. Co., Hazleton, Pa.
 S. C. Kissner, Citizens Telephone Co., Coshocton, Ohio.
 H. M. Keys, Philadelphia, Pa.
 S. T. B. Lee, West Penna. Telephone Co., Pittsburg, Pa.
 L. H. Lancaster, Thibodaux, Pa.
 O. H. Larwill, Keystone Telephone Co., Philadelphia, Pa.
 W. F. Lauback, Akron, Peoples' Telephone Co., Akron, Ohio.
 D. F. Lafean, York Telephone Co., York, Pa.
 A. R. Lamb, Bristol, Conn.
 O. M. Labarre, Baltimore, Md.
 J. A. Livers, Grottoes, Va.
 I. H. Moulton, Lacrosse, Wis.
 John M. Mack, Philadelphia, Pa.
 Michael Murphy, Philadelphia, Pa.
 Frank Maize, Electrical Bureau, Philadelphia, Pa.
 Harvey Myers, Memphis Telephone Co., Memphis, Tenn.
 J. D. Markham, Northwestern Telephone Co., Rush City, Minn.
 Edw. McCoy, Philadelphia, Pa.
 R. B. McPherson, Livingston Home Telephone Co., Howell, Mich.
 Allen C. Morse, Federal Telephone Co., Cleveland, Ohio.
 C. A. Mans, Anthracite Telephone Co., Hazleton, Pa.
 Fred May, Peoples' Telephone Co., Hazleton, Pa.
 J. E. Mifflin, Philadelphia, Pa.
 J. R. McLean, American Toll Telephone Co., Cleveland, Ohio.
 Jos. M. Miller, Sussex Telephone Co., Newton, N. J.
 W. E. Nicholsen, Home Telephone Co., Crawfordsville, Ind.
 W. M. Olheiser, Eastern Tel. & Tel. Co., Camden, N. J.
 A. T. Pressen, Iowa City, Iowa.
 Jos. C. Perry, Keystone Telephone Co., Philadelphia, Pa.
 Jerome Penn, Washington Home Telephone Co., Washington, D. C.
 F. M. Potter, Jr., Syracuse Telephone Co., Syracuse, N. Y.
 George F. Payne, Philadelphia, Pa.
 Jacob E. Ridgway, Keystone Telephone Co., Philadelphia, Pa.
 H. H. Robinson, U. S. Telephone Co., Cleveland, Ohio.
 G. B. Rudy, York Telephone Co., York, Pa.
 J. B. Rhodes, Zanesville Tel. & Tel. Co., Zanesville, Ohio.
 R. E. Russell, Western Penna. Telephone Co., Downingtown, Pa.
 H. L. Reber, Kinloch Telephone Co., St. Louis, Mo.
 Samuel B. Rawson, Rawson Electric Co., Elyria, Ohio.
 N. E. Robb, United Tel. & Tel. Co., Williamsport, Pa.
 C. E. Stinson, Rochester Telephone Co., Rochester, N. Y.
 S. P. Sheerin, New Telephone Co., Indianapolis, Ind.
 W. B. Seaton, Ashland, Ky.
 Vinton A. Sears, Eastern Aut. Telephone Co., Boston, Mass.
 John C. Sager, Electrical Bureau, Philadelphia, Pa.
 E. D. Schade, Johnstown Telephone Co., Johnstown, Pa.
 Dr. A. J. Stowe, Northwestern Telephone Co., Rush City, Minn.
 F. W. Schirmeyer, Citizens' Telephone Co., Decatur, Ind.
 O. C. Snider, Kansas City Home Telephone Co., Kansas City, Mo.
 J. H. Schofield, Dutchess County Telephone Co., New York, N. Y.
 C. E. Starr, Inter-State Telephone Co., Philadelphia, Pa.
 A. G. Scholl, Consolidated Telephone Co., of Pa., Mifflington, Pa.
 C. W. Scott, Lynchburg Telephone Co., Lynchburg, Pa.
 H. H. Stevens, Standard Tel. & Tel. Co., Newtown, Pa.
 L. W. Stanton, Federal Telephone Co., Cleveland, Ohio.
 Albert Smith, Norristown, Pa.
 Jas. M. Thomas, New York.
 Wm. J. Thompson, Eastern Tel. & Tel. Co., Gloucester, N. J.
 W. W. Townsend, North American Tel. & Tel. Co., Chicago, Ill.
 Geo. F. Trier, Delaware and Madison Co. Telephone Co., Fort Wayne, Ind.
 C. M. Thompson, Philadelphia, Pa.
 J. B. Ware, Peoples' Telephone Co., Detroit, Mich.
 C. E. Wilson, Keystone Telephone Co., Philadelphia, Pa.
 S. E. Wayland, Consolidated Telephone Co., Scranton, Pa.
 W. W. Wharton, Keystone Telephone Co., Philadelphia, Pa.
 A. M. Worstall, Inter-State Telephone Co., Trenton, N. J.
 H. W. Webb, Maryland Tel. & Tel. Co., Baltimore, Md.
 F. A. Wunder, Keystone Telephone Co., Philadelphia, Pa.
 W. A. Wynn, Raleigh Telephone Co., Raleigh, N. C.
 Dr. W. H. Walters, Pocomoke Telephone Co., Pocomoke City, Md.
 E. E. Webster, Twin City Telephone Co., Minneapolis, Minn.
 H. C. Worstall, Standard Tel. & Tel. Co., Newtown, Pa.
 R. H. Witz, Stanton, Va.

W. K. Whiting, Maryland Tel. & Tel. Co., Baltimore, Md.
 H. C. Young, Columbia, Pa.
 E. M. Yarnall, Eastern Electric and Construction Co., Philadelphia, Pa.
 J. E. Zeluff, Louisville Home Telephone Co., Louisville, Ky.

EXHIBITS.

The North Electric Company, of Cleveland, Ohio, had an elaborate exhibit on the ground floor of the Keystone Telephone Building.

Beside a large line of telephones they had a complete series of unit type switchboards built up in both 100 and 200-line units for magneto call, direct signal or lamp signal work.

Mr. F. F. Sapp, the advertising manager, who was in charge of the exhibit, designed a very clever and unique souvenir in the shape of a good luck button, with a rabbit's foot attached, and having the motto, "Try North for Quality."

There were in attendance, beside Mr. Sapp, President C. F. North and Messrs. J. P. Downs, Dudley B. Wick, Jr., from the engineering department, and Mr. Raymond Hendricksen, from the sales department.



The Holtzer-Cabot Electric Company, of Brookline, Mass., had a very effective exhibit in the Keystone Telephone Building, and were represented by Mr. J. J. Esterbrook and Mr. D. M. Bliss. One new feature of Holtzer-Cabot apparatus shown is the monogram "H. C." on their magneto generators.

The showed the Ness automatic inter-connecting telephones with automatic return of the switch to the home point when the receiver is hung up.

On exhibit also were their latest sets for hotels, etc., equipped with a self-contained hook-switch, so arranged that the circuit cannot pass through the hook lever.

It may be mentioned that all magneto generators of this company are equipped with a pulsating attachment for selective signaling.



The Lambert-Schmidt Telephone Manufacturing Company, of New York, Mr. Walter W. Bostwick, Jr., in charge, had in the Keystone Building, as part of their exhibit, a 200-line common battery switchboard fully connected for operating.

Also a ten-drop switchboard using cams instead of plugs and cords and jacks.

Among the other new instruments shown was the army type field set, and bridging generators, series generators, multiple jack springs, lamp jack strips, portable desk telephones, with double and single pole receivers.

They exhibited several styles of hand microtelephones, and had complete sets of generator call and common battery systems, the latter of which is in use in the Keystone Telephone Company's Exchange in Philadelphia.

A neat little celluloid pocket ruler was given as a souvenir to all visitors.

Messrs. Lambert-Schmidt and John Roach also represented the company.



The John A. Roebbling's Sons Company, of Trenton, N. J., had a complete exhibit at the Walton, and were represented at the Convention by Messrs. W. L. Doyle, U. S. Tingley, D. F. Ivins and C. B. Cushing, of Trenton, and Mr. S. W. Swan, of New York. They had samples of their insulated wire and dry paper lead-encased cables, switchboard cables, interior wires, making a particular display of large size underground cable wires.

Mr. W. P. Bowman, of Cleveland, was in charge of the exhibit.



The Swedish-American Telephone Company, of Chicago, had a small but attractive exhibit in the Hotel Walton. The company was represented at the convention by its president, Mr. E. B. Overshiner. They exhibited several types of their instruments, the character of which are well known.

Handsome souvenir watch charms were distributed, being an exact fac-simile of their standard receivers. These receivers will be mailed to any one by a request to Mr. Overshiner.



The Stromberg-Carlson Telephone Manufacturing Company, Chicago, had an attractive display in the Keystone Telephone Building, in charge of Mr. E. L. Brown. The company was also represented by Messrs. C. W. Stiger, A. J. Rousseau and S. D. Reese. The exhibit consisted of a sample magneto board, visual signal "central energy" board, lamp signal board,

and a full line of central energy and magneto telephones. They also had a lineman's test set, which is probably the smallest on the market, a new mine and street railway telephone encased in iron, hermetically sealed with a rubber gasket, so it is both moisture and dust-proof. They had a new selective ringing device for party lines.

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The Electric Storage Battery Company, of Philadelphia, had an exhibit of their "Chloride Accumulators" at the Walton, and were represented by Messrs. H. B. Coho, Bruce Ford, H. B. Gay and R. C. Hull. These cells are particularly adapted to telephone work. Their perfection in the last few years has had much to do with making the central energy system a success. One of the new features shown was a device for connecting the plates which allows them to be inspected without disturbing any other element.

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Mr. F. E. Mayberry and Mr. N. H. Holland had a working exhibit of a new party line selective signaling and locking system which The Mayberry-Holmes Company, of New Medford, Mass., are just putting on the market. The apparatus is entirely automatic, central being signaled upon the subscriber lifting the receiver off the hook, and at the same time all other parties on the line are automatically locked out. The locked out stations display a "busy" sign. These instruments have been installed for some time in practical service, and it is said they are meeting all requirements in a most satisfactory manner.

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The Sumter Telephone Manufacturing Company, of Sumter, S. C., were located in the Hotel Walton, where they had an attractive exhibit of the instruments manufactured at their plant in Sumter. All the parts for a complete telephone are made and put together by this enterprising company. They make a specialty of fine wood finishing, the material for their telephone sets being sawed in their own mill, only a short distance from the manufacturing plant.

The exhibit was in charge of Mr. F. C. Manning, who was assisted by Mr. Louis G. Le Bourveau.

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The American Electric Telephone Company, of Chicago, displayed a full line of their instruments.

The special feature was a new type of selective signaling device. This is known as the Leich system of party line telephones, and is based upon the principal of currents having different frequencies. A selective key is furnished with the system, and either a Warner generator or a high frequency power generator may be used.

They also had a complete line of central energy and magneto call telephones. The company was represented by President P. C. Burns, General Manager J. G. Ihmsen, and Messrs. John H. Reid and S. J. Bear.

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The F. Bissell Company, of Toledo, Ohio, displayed their cables and conduits at the Walton. The exhibit was in charge of Mr. C. M. Hamilton. Among the new features gotten out recently by this company is a cable control for stringing cable. With this device five men in about an hour can do as much work as sixteen men under the old system can accomplish in from three to five hours.

They also had cable brackets, manhole guards and a new style of conduit rod, which is furnished in short sections, and can be coupled and uncoupled only at an angle of forty-five degrees; when coupled it is locked. There is a sufficient looseness at the joints to secure a hammer blow and thus clear away any obstructions.

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The Gordon Battery Company had an exhibit of their wares in the Walton in charge of Mr. W. C. Banks, of Chicago.

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The Russell Tomlinson Company, Danbury, Conn., exhibited in the Keystone Building, and was represented by Mr. W. E. Russell.

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The D. & W. Fuse Company, of Providence, R. I., had an exhibit of their new telephone protectors, which are marvels of simplicity. Messrs. W. S. Sisson, W. J. Leggett and F. C. Jaeger were the representatives.

Messrs. H. Grant Thompson, Franklin A. Thompson and Charles Luke represented the New Haven Novelty Machine Company, of New Haven, Conn., at their exhibit of "Novelty Slideable Sleeve" and fittings for cable connections.

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The Viaduct Manufacturing Company, of Baltimore, had their exhibit in the Fidelity Mutual Building, where Mr. William O. M. Le Bauer and Mr. Marion B. Davis were present to explain their display.

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The Ericsson Telephone Company, of New York, exhibited some of their latest switchboards at the Walton. They were represented by Messrs. K. Weman and C. E. Monroe.

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The American Vitriified Conduit Company, of New York, had a small exhibit of their conduits in the convention hall. Mr. B. S. Barnard was their representative.

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Mr. C. H. Barney, for the Monarch Fire Appliance Company, of New York, distributed as "Kilfyre" souvenirs a match safe in the shape of a small book, appropriately titled "Incipient Fires."

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The General Electric Company had their lamp department represented by Messrs. H. Westberry and F. W. Wilcox, who distributed probably the neatest souvenir at the convention. They were miniature electric light bulbs, gold plated, for pins or watch charms.

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The Kellogg Switchboard and Supply Company, Chicago, had as their representatives Messrs. Kempster B. Miller, F. J. Dommerque, J. C. Belden, Paul W. Bossert, A. E. Barker, S. C. Platt and Arthur B. Kratz. They had, in the new Keystone exchanges, the best expositor of their switchboards possible.

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James G. Biddle, of Philadelphia, exhibited a complete line of his condensers for central energy systems and also the Fisher cable testing sets.

TRADE REPRESENTATIVES.

Smethurst & Allen, of Philadelphia, were represented by Mr. R. D. Allen.

Drake, Breed & Co., of Philadelphia, were represented by Mr. George Breed.

McRoy Clay Works were represented by E. F. Kirkpatrick, of Chicago.

The Walker & Kepler Company, of Philadelphia, had Mr. Louis J. Costa at the convention.

Sterling Electric Company, of Lafayette, Ind., was represented by Mr. W. E. Doolittle.

Williams-Abbott Electric Company were represented by Mr. L. Sands and Mr. S. A. Duval, of Cleveland.

National Conduit and Cable Company was represented by Messrs. James P. McQuaid and Stanley Eckert, of New York, and Mr. S. D. Beylard, of Philadelphia.

Newhall Chain and Forge Company was represented by Mr. A. R. Ermusch, of New York.

William D. Sharky, consulting engineer of Philadelphia, registered at the convention.

The Standard Underground Cable Company was represented by Mr. T. E. Hughes, the manager of the Philadelphia branch, and Mr. P. H. W. Smith, the company's assistant general manager.

The Consolidated Telephone Company, of Cleveland, was represented by Mr. B. G. Hubbell.

Mr. W. A. Hopkins, Jr., represented the interests of the Erner-Hopkins Company, of Columbus, Ohio.

Helios Upton Company was represented by Mr. Harry Huskey.

Illinois Electric Specialty Company, of Chicago, was represented by Mr. F. Patten and Mr. P. J. Hertz.

J. Allen Heany was at the convention for the American Electric Manufacturing Company, of Philadelphia.

Frank G. Jones, of Chicago, and W. B. McCurdy, of New York, represented the American Electric Fuse Company.

Varley Duplex Magnet Company, of New York, was represented by Mr. J. M. Knox.

Atwater Kent Manufacturing Company, Philadelphia, represented by Mr. A. Atwater Kent.

J. J. Lerch was on hand in behalf of the Reading Electrical Company, of Reading, Pa.

H. C. Roberts & Co. was well represented by Mr. John Mustard, of Philadelphia.

"Okonite" was represented by G. T. Manson, of New York.

Chase Shawmut Company, of Boston, was represented by Mr. H. P. Moore.

B. P. Nungesser, of Cleveland, represented the interests of his battery at the convention.

Alfred F. Moore insulated wire had W. W. Pawling as representative.

The Manhattan Electrical Supply Company, of New York, was very ably represented by Mr. I. M. Post.

Clark Automatic Telephone Company was represented by J. L. Putnam, of Providence, R. I.

Darlington Electrical Supply Company, of Philadelphia, had Mr. D. Scott Quintin at the convention as their representative.

International Telephone Manufacturing Company, of Chicago, was represented by Mr. Henry Shafer.

Mr. C. Seyler represented Hubbard & Co., of Pittsburg.

John H. Shaper, of New York, represented J. Edward Ogden & Co.

Vallee Electric Company, of Philadelphia, was represented by Messrs. G. A. Vallee and Thomas L. Townsend.

The Crocker-Wheeler Company, of Ampere, N. J., was represented by Mr. J. R. Wilson.

Warner Electric Company was represented by Mr. T. W. Warner, of Muncie, Ind.

American Electrical Works was represented by Mr. W. J. Watson, of New York.

THE AMERICAN TELEPHONE JOURNAL was represented by Messrs. W. H. McDonough, Paul Latzke and E. F. Edmunds, of New York, and Mr. Elmer E. Smith, of Chicago.

Other representatives of the technical press were: Messrs. Frank L. Perry, M. L. Godkin and John J. Flanagan, *Western Electrician*; E. E. Wood, W. K. Beard and Cecil P. Poole, *American Electrician*; H. B. McMeal, *Telephony*; S. H. Goddard, Russell Howland, A. E. Dobbs and P. P. Dodd, *Electrical Review*; G. W. Elliott, T. C. Martin, Charles T. Walker and J. M. Wakeman, *Electrical World and Engineer*, and Frank R. White, of *Electricity*.

THE WISCONSIN CONVENTION

THE Summer Convention of the Independent Telephone Association of Wisconsin was held at Waupaca, Wis., June 25, 26 and 27. At the same time and place the Northwestern Electrical Association held its convention.

The Telephone Convention was held in the Grand View Hotel, and, despite the chilly weather, a representative body of Wisconsin Independents were assembled when President Richard Valentine, at 2 p. m., June 25, called the meeting to order. In his opening address President Valentine spoke of the continued growth and progress of the Independent movement in Wisconsin. Since January 1 twenty-nine new Independent companies had organized in Wisconsin, he said, with a total capital of \$570,-

Mt. Horeb Independent Telephone Company and the Dane County Rural Telephone Company.

A meeting of the Committee on Toll Rates was ordered to discuss the toll rates with the president and secretary of the association and make a report at the next session.

Mr. Montague, of the Ericsson Telephone Company, New York, was the next speaker. His remarks were on the use of telephone toll lines for telegraphing. This is being done in many places in Europe, and he said the Ericsson Company had conducted exhaustive experiments on the Illinois Central Railway's lines, which had demonstrated the practicability of the project. By means of this a telegraph message may be sent over



DELEGATES TO THE WISCONSIN CONVENTION, WAUPACA, JUNE, 1902.

ooo. This was particularly gratifying, as it indicated that the people of Wisconsin realized the advantages to be had through the advent of Independent telephone construction. President Valentine laid particular stress on the fact that the farmers were using telephones more and more. These farm telephone lines are being developed, and promise to soon form a complete network of the State. Another encouraging sign, he said, was the fact that only a very few lines, and these operated by the smallest companies, had connected with Bell toll lines since the February meeting. In conclusion he said there was an excellent prospect for the granting of the Milwaukee franchise, which would make the construction of Independent toll lines a certainty.

Two new members were received into the association—the

the wire at the same time a telephonic conversation is being carried on. This increases the capacity of the circuit about one-third, and naturally the revenue of the toll line.

Advertising designs for Independent public telephone service were shown by Mr. L. W. Burch, of the Electrical Supply Company, of Madison, Wis.

Mr. O. J. Perkins, of Perkins & Sons Company, of Medford, Wis., brought up the subject of automatic boards, which he said he was using at a cost of 2 per cent. of gross receipts. The system worked in a very satisfactory manner.

This concluded the business for the day, and an adjournment was taken until Thursday morning.

The Thursday session was held at 10 o'clock, when a paper

was read by Mr. H. C. Winter, of the Dane County Telephone Company, on toll rates.

The committee for the adjustment of toll rates then made its report. After a thorough discussion, Mr. A. L. Hutchinson moved that the present committee be continued until the February meeting at Milwaukee, and be given authority to adjust rates in accordance with their report. This was carried.

The secretary was instructed to have the report printed and sent to every Independent company in the State, whether members of the association or not. The rates as agreed upon are to go into effect on the 1st of August.

Mr. Hutchinson then read a paper on "Toll Clearing," which is printed elsewhere in this issue.

Upon request of the convention, Mr. Robert B. Abbott, of the John A. Roebling's Sons Company, read an article on the "Magic Telephone," by William Henry McDonough, editor of the AMERICAN TELEPHONE JOURNAL, which appeared in the SATURDAY EVENING POST, Philadelphia, of June 14.

A motion was carried putting into effect a night toll rate of one-half the day rate, with a minimum charge of 10 cents. Where necessary, the few cents to make the charge divisible by five will be added. For instance, where the day rate is 25, 35, 45, the night rate will be 15, 20, 25.

No other business being before the convention, it adjourned at 11:30 a. m. Before adjournment a resolution of thanks was voted to Waupaca and the Electric Railway and Light Company for the many courtesies extended.

Thursday night a dance was tendered the members and their wives, which was largely attended by the residents of Waupaca, and was a most enjoyable function. A band was in attendance all three days of the Convention.

Friday was devoted to outdoor sports. Numerous contests were arranged, running, jumping, sack race, potato race and a ball game between the telephone people and the electrical delegates. Suitable prizes were provided for all these contests. The star performer in the various events was Mr. William Bradley, who represented both the telephone and lightning plants of Tomahawk. He contested in four events, and carried away

four prizes. In the ball game he pitched for the Telephonists, and they won by a score of 12 to 8.

Among those present at the Convention were: Richard Valentine, president, Rock County Telephone Company, Janesville; A. L. Hutchinson, Little Wolf River Telephone Company, Weyauwega; H. G. Slater, vice-president Citizens' Telephone Company, Waupaca; Charles Schoeninger and H. E. Kepler, of the Inter-Urban Telephone Company, Sun Prairie; A. J. Perkins, Perkins & Sons Company, Medford; H. C. Winter, secretary Dane County Telephone Company, Madison. Many other operators were also present. The Wisconsin manufacturers were also particularly in evidence, nearly all of them having one or more representatives at the convention. The technical press was well represented.

It was currently reported that Oskosh will be granted a franchise in a short time. Capital for immediate construction of the plant is already in sight. Mr. A. B. Ferdinand, owner of the Sheboygan Exchange, is behind this movement, and is the active spirit in working for the franchise.

If this Oshkosh project goes through, in all probability a big combination will be formed, consisting of the Fox River Valley Telephone Company, Appleton; Sheboygan County Telephone Company, Sheboygan, and Little Wolf River Telephone Company, Fond du Lac.

This big company will then build and operate exchanges in Neenah, Menasha and Kaukauna, where the Fox River Valley Telephone Company already has franchises. As soon as franchises can be obtained by this company, in the event of a combine, exchanges will be built in all the towns in the valley from Marinette, Wis., and Menominee, Mich., which are separated only by a river, to Fond du Lac, Wis.

If all this is done the prestige gained will insure the granting of the Milwaukee franchise, as the same men back of the proposed combination are working hand in hand with large Milwaukee capital for the latter franchise. Other Milwaukee capitalists have expressed a willingness to back a toll line to cover the entire State, as soon as the Milwaukee franchise is granted.

NEEDED IMPROVEMENTS IN INDEPENDENT TELEPHONY*

By L. W. STANTON

OUR several subjects are of vital importance to the Independent Telephone movement, and it is only through the proper realization of these problems that the Independent companies may hope to maintain the standing that this great Independent movement has attained. Our competitor, the American Bell, has a well organized and disciplined force of employees, standardized apparatus of the highest type and years of practical experience.

The Independent Telephone Companies have popularized telephony, and placed telephones in residences and places of business to an extent undreamed of before the advent of Independent telephony. They have achieved wonders and astounded the telephone world with the progress they have made during the comparatively brief period of time they have been in the field. They have yet their crucial period to meet.

There are three giant problems: tariff, traffic, and equipment. These are deserving of as much sound consideration as any problem in the industrial field to-day.

Public sentiment has been a very prominent factor in the Independent field, but it is becoming more and more apparent that the company giving the best service and the most courteous treatment will secure the business.

The discriminating public have favored the home companies on account of their origin and the conditions under which they were brought into existence. This protection has extended over a number of years, but the time will arrive when the Independent companies, even though they be owned locally, must demonstrate their ability to furnish service as good or better than that of their competitor. The writer is acquainted with several Independent exchanges in which the service is inferior to that of the Bell Company, yet the public tolerate it, remembering the

treatment they formerly received before the inauguration of the Independent companies. This will not always exist. The public is prone to forget.

The company furnishing the best service to the greatest number at an equitable rate will, unquestionably, do the greater business. For the Independent companies to bring about such conditions requires a far reaching revision in their present tariff system, a change in their engineering and equipment, and attention to details in traffic, the like of which they at present wholly fail to appreciate.

In our larger cities there are thousands of families and hundreds of small tradesmen that cannot afford to pay for flat rate individual service, neither can the telephone company from a financial standpoint afford to reduce its rate to meet these requirements. The inevitable results are party-lines and measured service. I know that a great many are opposed to this class of service, some for reasons which are valid, and some for reasons which are thought to be valid, but which are not. There has been a great deal of prejudice against the party-line, owing to poor apparatus and inferior traffic arrangements.

A great deal has been due to public sentiment, which is unjust to the telephone company and unjust to the subscriber who cannot afford individual metallic service. By the use of the party-line thousands of subscribers can be served that could not otherwise afford individual service. With a good system of four-party-line selective service, with the traffic details well worked out, the small user is almost as well off as if he had individual service. You say that it works an injustice to the subscriber who has individual service. It is quite the reverse. It is optional with him whether he will use the party-line or not, but in ninety-nine cases out of a hundred he is glad to have a chance to telephone to his party, even though it be over a party line.

Let us now look into the financial aspects of the party line. We will assume the exchange from which we draw our figures to be one of 5,000 lines, built at an average cost of \$100.00 per

*Paper read at the National Convention, June 26, 1902.

line, and \$25.00 extra for each additional party-line station, including the telephones, interior wiring, line drops, etc. We will assume the rate for individual service to be \$48.00 per year; \$15.00 per year for operating individual service telephones, and \$7.50 per year to operate each additional party-line telephone. Figuring interest at 5 per cent., and depreciation at 10 per cent. on the amount invested, we find by referring to the chart that upon doubling the number of telephones on the line and decreasing the rate $\frac{1}{4}$ we decrease the net revenue per station, and increase the net revenue per line. What is most noticeable is that the net earnings on investment per line are greater for both 2 and 4 party line than for either a greater or less number. A point that should not be lost sight of in establishing party line rates is that a dollar or two difference in the rate makes considerable difference in the net percentage earned on the amount invested, as is shown by the two rates on the 4 and

Measured service handled in this way gives the subscriber very prompt and efficient service. This class of measured service used in connection with a four-party line will give excellent results. Suppose you allow each party line subscriber 600 or 1,000 outgoing calls per year on a four-party line or 1,200 to 1,800 on a two-party line, at a minimum charge with a fixed rate per message for all additional calls; all incoming calls free. Handled in this way the report "line busy" will be no more frequent than it is with individual unlimited service; in fact, the calls will probably average less per four-party line than with unlimited individual lines.

In a peg count which the writer examined, where there were nearly 5,000 party line stations, all of which were either meter or nickel service, the average traffic per day, per station, was 1.3.

In regard to secrecy or privacy of a properly designed party line system, it is almost as private as with individual lines with

COMPARATIVE DATA—PARTY LINE SERVICE—6,000 LINE EXCHANGE

No. of Stations per Line	Av. Cost per Line	Rental per Line per Year	Cost to Operate per Line	Interest on Investment per Line	Depreciation 10 per cent. per Line	Total Cost Opr. Int. & Deprec. per Line.	Net Earning per Line	Net Earning per Station	Net Per Cent. Earned on Investment per Line.	Net per cent. earned on investment per line, taking \$36 as the rate for individual lines.	Net per cent. earned on investment per line, taking \$80 as the rate for individual lines.
1	\$100.00	\$48.00	\$15.00	\$5.00	\$10.00	\$30.00	\$18.00	\$18.00	18	6	50
2	125.00	36-72	22.50	6.25	12.50	41.25	30.75	15.62	24+	10 $\frac{3}{4}$	63 $\frac{3}{4}$
4	175.00	27-108 24-96	37.50	8.75	17.50	63.75	44.25 32.25	11.06 8.03	25+ 18+	9 2-7	66 2-7
8	275.00	20-160 18-144	67.50	13.75	27.50	108.75	51.25 35.25	6.41 4.40	18.6 13.	4	59 4-11

8 party lines. While the above table lays down no special rules to work by, it calls attention to facts that should not be lost sight of.

From the foregoing we see that the party line is a success from a financial standpoint, and a necessity from the view that the company serving the greatest number of people renders the more valuable service, and will, therefore, secure the business, if the service is kept up to the standard.

We will now look at the party line from a traffic and tariff standpoint, which is an exceedingly complex problem. There are three principal objections to the party line:

First, the annoyance from all the bells ringing when only one is wanted; second, the frequent report of "line busy;" third, the service is not private.

The first objection can be almost entirely eliminated on party lines of four or less, providing the equipment is of proper design and the operating is good.

The second is a more difficult problem. If there are two or more parties on the line with unlimited service, the line will frequently test "busy." To remedy this, some form of measured service will be necessary. While it is admitted that measured service adds complications, it is undoubtedly the most equitable method of charging. While there are several forms of measured service, there are none that entirely fill the requirements. Automatic apparatus, either at the station or on the switchboard, is not satisfactory, for in case the line called for should be busy there would be a call registered without the party securing the service. With either a meter or slot machine placed at the station the service is slowed up, for the operator must remain in on the line until the called for party is secured and the calling party has registered or deposited the required coin. This also works a hardship on the party called for, as it is necessary to wait until the party calling deposits the coin or registers. The system of measured service where a meter is user is also more expensive, inasmuch as it requires a visit to each station to take the reading of the meter before a bill for service can be rendered.

The system in use in a number of the largest Bell exchanges, and the one which gives the best general results, is that the operator marks down the number of the party calling, and in case the call is not completed she draws a line through that number. Each hour these sheets containing the record of the calls are collected and sent to the accounting department.

a lamp signal board and selective ringing, the different parties on the line have no means of knowing when a party is calling or being called, and if a line is in use they can readily hear another party come in on the line. With the three main objections just cited, handled as above described, the party line gives a very desirable service and comes within the reach of a class of patrons or users that would otherwise be barred. From the foregoing it is plainly evident that the party line has a mission of importance to fulfill.

Up to the present time the demand for the party line equipment has not been very great, and the Independent manufacturers who have done so well in furnishing equipment, have not given this subject the attention that it must receive in the future. One of the leading manufacturers is just placing on the market a four-party selective system which depends upon the number of frequencies to operate the bells. From the limited experiments the writer has had an opportunity to make, the system seems to possess valuable points over the pulsating bell type, which has been used by the Bell Company.

Before party line service can become thoroughly commercial among the Independent companies, the manufacturers will have to revise their design of equipment. While the Independent companies are beginning to realize the value of the party line, they need equally to realize the danger there is of very seriously impairing the efficiency of their present service. If inferior apparatus is used, or if the apparatus is not properly installed, or if the operating is not under proper discipline, the service will be such that the company will lose rather than gain by adopting party lines. One of the greatest needs of the Independent telephone interests is either for this association or a kindred association to take up, in a technical way, the practical subjects of traffic engineering and equipment. There are thousands of dollars being wasted through ignorance, which could be avoided to a considerable extent by action on the part of such an association. If Independent telephony is to be a real force in this country, such an association must, sooner or later, be organized.

There is no progressive art in which the practical exponents do not get together and discuss the practical and technical problems which are sure to arise, and in such an industry as telephony this is particularly desirable, for in no other industry does the conduct of one company so intimately affect the affairs of another, being linked together as they are (or soon will be)

by one vast network of long distance lines to the end that one huge national system of inter-communication is established. With the millions that are invested and the opportunities that are open, it is a crime to the Independent telephone interests that a little closer union and more uniform equipment are not adopted. The day of long distance telephony is just beginning, and for the Independent companies to handle their share of the traffic and give the class of long distance service that will be demanded, it will be necessary to adopt a more standard form of equipment.

The writer's experience on the United States Telephone Company's long distance lines is that where 20 volt and 40 volt common battery systems made by different manufacturers are connected together, the results are unsatisfactory. So much so that in one case where a 40 volt system was installed, the former toll business at that place was almost lost for a period, owing to the inefficiency of the system for long distance work. Later a change was made that remedied the condition to some extent, but the system has never given the service it should. The trouble just cited was not due to the fact that it was a 40 volt system, which voltage is probably more nearly correct, but to the fact that the system was improperly designed for receiving incoming toll business.

The above well illustrates why telephone apparatus should be standard. From the output of the various Independent manufacturers there could be selected a line of high-class apparatus that would be worthy of standardization.

Our competitor, the American Bell, has standardized apparatus, with excellent results, and the Independents, until they adopt standard equipment, will necessarily give an inferior class of service.

If a traffic and engineering association were formed, there are many subjects pertaining to engineering and traffic on which pa-

pers should be written and thoroughly discussed; this would be of inestimable value to the Independent movement.

The problem of giving long distance service makes such an organization doubly necessary. If the Independents expect to handle long distance business in an up-to-date manner, deriving the greatest amount of revenue from the capital invested, building their connections by ticket wire, and leasing their wires to brokers and large corporations for telegraphing, while the telephone company is using the same wire for telephone purposes, considerable forethought and sound engineering will be required.

If the long distance trunk lines are to be built by different companies, the companies should consult each other, decide upon the class of construction and equipment, and more important yet, on the location of their relay or switching stations—I mean locations along the trunk lines where testing trouble is to be done, where operators are located for switching purposes, and where telegraph apparatus such as relays, repeaters, Morse panels, batteries, and so on are located for handling leased wire work. The proper location of these switching stations is a very important matter. They should be located a certain distance apart to get the best results from the telegraph apparatus. They should be located at junction points on the east and west and north and south trunk lines. This location is very important from three points of view. It is very important from a view of economically and properly handling the Morse or telegraph. It is important from the fact that the operators should be able to switch their messages to any point of the compass; and third, it saves the expense of building and maintaining additional switching stations. From the foregoing I am in hopes that the Independent companies will realize the absolute necessity of technical association to solve the problems that cannot be solved by each company working independently.

THE TELEPHONE SITUATION IN THE NORTHEAST*

By LEWIS A. GOUDY

I WAS pleased to learn that the Committee on Program were apparently students of the Bible. It is an indication that the leaders in the development of the great Independent telephone movement are inspired by a high sense of responsibility to the people and the cause of an honest public service issue. Acute thinkers and men of sound judgment—they have followed the Scriptural rule through their instructions to the Program Committee that—"The last shall be first and the first shall be last." And I am the victim of their wisdom.

They are also evidently politicians of experience. You all know that it is customary in political meetings to introduce the light weights first, reserving the "big guns" for the closing—a wise rule, as it holds the delegates for the last good things, of the "feast of reason, and the flow of soul," which the Committee on Entertainment have seductively arranged to "top off" with the attractions of Atlantic City for dessert.

But to my subject: "The Telephone Situation in the Northeast." New England has a comparatively dense population, particularly Massachusetts, Rhode Island and Connecticut, and yet with all of their great wealth and material prosperity but a very small percentage of their people are subscribers to the telephone. The same rule prevails in Vermont, New Hampshire, and the State of Maine. In the latter (my home State), less than one and one-half per cent. of the population are subscribers to telephone service, with even a lower percentage in New Hampshire and Vermont. Why? Because the licenses of the Bell Telephone Company have demanded such extortionate rates, local and long distance, for (as a rule), exceedingly poor service, confined principally to the cities and thickly populated centers. The farmers and rural communities have been ignored or compelled to pay such extortionate rates for limited and defective service, that there has been but little use of the telephone in the country districts. Recently, however through the aggressive and persistent efforts of the Northeastern Telephone Company, particularly, in conjunction with local enterprise of citizens of village communities, a change has taken place, and a spirit of aggressiveness is manifesting itself which is putting the monopoly (the New England Telephone & Telegraph Co.) on its mettle. The lines quoted, I think, by your distinguished secretary in a paper at a previous annual convention of this Association:

"When the devil was sick, the devil a monk would be;
"When the devil was well, the devil a monk was he."

*Paper read at the National Telephone Convention, June 25, 1902.

is applied to the Bell Telephone Company, or its licensees in the Northeast, most aptly. The grip of the monopoly has been an iron one from its birth in 1878 to the present time. Opposition has been bought off, as instanced at the beginning, by the elimination of the Western Union Telegraph Company as a competitor worth of its steel, since which time only spasmodic, feeble and disconnected efforts for competition have been made.

The company which I represent was then The Dirigo Telephone Company of Maine, and was the first legally chartered corporation granted broad and liberal rights by the State, to lock horns with the New England (Bell) Company. It was promptly placed, for the time being, *hors de combat*, like the Irishman who tackled the bull, but with the usual happy pugnacity of the gentleman from Erin, who exclaimed, after being thrown over the fence: "Begorra! It's lucky I had me laugh furst." The Dirigo Company of Maine continued in the field and never surrendered or lowered its colors until now, this corporation, under its new name, "The Northeastern Telephone Company," is giving the old bull of monopoly a red-hot fight. The Northeastern's companion, which should have been its ally or partner, the Eastern Telephone Company, of Rockland, has succumbed and surrendered to the blandishments of the almighty dollar, and is now the tool and associate of the New England (Bell) Company, thereby leaving the Northeastern Telephone Company the only absolutely Independent long-distance competitive company in the field, with liberal State charters for both Maine and New Hampshire, and owning trunk lines, connecting between sixty and seventy exchanges and toll stations continuously, through as many towns and cities, with two hundred and sixty odd miles of pole line construction from the Rangeleys in the north, through the western, central and southwestern section of Maine, terminating at present at Portland, the chief commercial city of New England, outside of Boston; in conjunction with its connections with other small companies, it has options on other lines which will take it into New Hampshire, for which State it has a valuable charter.

The Northeastern Company owns and controls the secret service automatic system for the Northeast, and has perfected its plans for installation of that system in several cities in Maine and New Hampshire; the people of the latter State being aggressively awake, are pushing for competitive telephone service (through the Northeastern Telephone Company) with a vim typical of the West.

The company has nearly one thousand subscribers to its service, actual and immediately prospective. In fact, the demands are so great that it has been impossible to meet them promptly. Bangor, Skowhegan, Waterville, Augusta, Hallowell, Brunswick and Westbrook are all calling on us to install competitive service at once. In substantially all of these cities and towns, our licenses are secured, which, when exercised, will connect with our trunk line service now in operation as before noted. Capital is our only requirement to enable us to become the strongest opponent of the Bell Company in the East. That necessary adjunct to our other great and valuable rights, privileges and physical properties, we expect and hope to secure very soon, now that our plans and propositions have become perfected for large expansion of the service. We shall use the secret service, automatic exchange system (Strowger) for the larger exchanges, in conjunction with the manual, party line service for long distance connections, and smaller community exchanges, in which we have successfully tested a selective party line device which makes every line a private one, thereby centering in the Northeastern Telephone Company a combination which the Bell Company cannot beat or overcome, electrically or financially.

All of these important acquisitions for the aggressive development of competitive telephone service in the Northeast have cost not only a large amount of money, but endless, persistent unyielding effort, some of the incidents of which may be interesting to you. My experience in Maine has been sufficiently interesting, particularly to myself, to keep me busy since I became, within two years, actively identified in the great fight which Independent telephone interests are making for the people.

I will begin by quoting the following section from the laws of Maine of 1895, chapter 103, portion of section 3, which reads as follows: "But no corporation organized hereunder shall have authority, *without special Act of Legislature*, to construct its lines along the route or routes used, or authorized to be used by any telephone or telegraph company, person or firm, or between points connected or authorized to be connected by the lines of any such company, person or firm, unless it shall first obtain the consent of such company."

This piece of legislation, one of the most damnable ever placed on the statutes in this country by so-called "representatives of the people," was intended to perpetuate the monopoly in Maine and nullify the Declaration of Independence and the Constitution of our own State, which is similar to that of all other States, based as they are on the Constitution of the United States as constructed by our patriotic forefathers, who believed with Lincoln, in a "Government of the people, for the people, by the people." Modern statesmanship reverses the principle and institutes unconstitutional legislation for the benefit of *the few, for the few, by the few*." This statute was enacted about the time that the Independent movement began, following the honest termination of the Bell patents. Such laws are worthy only of those

"Whose honor rooted in dishonor stands;

Who are faithful only to the faithless few."

or, who have adopted David Harum's theory, "Do others, or they'll do you; and do 'em fust." Such a principle may be excused in horse trades, but representatives of the people, whether in city councils, State Legislatures, or Congress, ought to be impeached and help up to the indignant scorn of their outraged constituency.

Connecticut, through its Legislators, was similarly imposed upon, but not to quite such an open nullification of the rights of man. Evidently the representatives of that State (nearer Tammany Hall though they may be than the *honest* representatives from Maine) thought the dose too strong to be tendered to their constituents, and their law as enacted provides substantially, that no competition shall prevail unless consented to by the judge of certain courts of the lower strata, evidently applied morally, as well as legally.

In addition to the evidences of sinister and apparently corrupt legislation in the "seats of the mighty," are the records of rotten manipulation of municipal governments, or majorities thereof, as there is always an honest *minority* that "cannot be bought and will not be sold," or allow their constituents to be imposed upon. The most devilish methods have been used by the agents of the monopoly company, high or low in position, to defeat and destroy the possibility of competition. Sometimes the weaklings have been satisfied with bacchanalian entertainment in return for or preceding their votes. Others who had political ambition to

satisfy, were assured of financial and political support as a consideration for their perfidy. Others still (and I presume that even Philadelphia may have a few such men) demanded more tangible tribute in the shape of substantial money contributions under the cloak of "election expenses," etc. Even high and honored representatives of financial institutions and allied monopoly corporations, many of them, I regret to say, members of the legal fraternity, have been and are recipients of retainers from the great "octopus," supplemented by franks for long distance use of the telephone company's lines, and free service from local exchanges, with other similar corrupting evidences of dishonesty to the great public, which such men look upon only as a means to an end to enrich themselves or advance their political ambitions, all of which has become the crying sin and shame of our American Government—municipal and otherwise—in its relation to the people's interest.

In order that I may not be accused of spreading scandal I will state that I have the proof in my possession to convince the most skeptical that what I have said is true, and I have not told the half; but even without proofs, the public record of scandalous legislation is amply convincing of the debauchery by which the great monopoly has entrenched itself (in the East, at least) for the purpose, directly and indirectly, of robbing the public of its substance and rights, whereby its original owners have become multi-millionaires, a condition which the owners or controllers of public-service companies should never attain. For my part I believe such services will ultimately be acquired and come under the control of national, state and municipal governments, for the accommodation and direct benefit of the citizens at large.

The financial policy of the licensee company of the American Bell in the Northeast is dictated by the magnates of that enormously watered stock corporation. In the Northeast, the New England Telephone and Telegraph Company, in the days of its poverty and limited power, was reasonable in its charge for service, and accommodating in its relations with the public. An early circular, a copy of which was loaned me for this occasion, is on exhibition at the secretary's desk. It states that the rate for service was \$20 for residence use, and \$40 for business, a standard for annual rentals, on substantially the basis that the Independent companies are charging in cities throughout the country, as against, in many cases, fourfold higher rates and in New York City sixfold, or \$240 for single line service. In Portland, the company's rates are from \$25 for the exceedingly exasperating and annoying party line service, up to \$75.00 for residence use, and \$85 for business single line service, with more or less extras for so-called special conveniences. In other sections of Maine and the Northeast, their rates are made to fit the local conditions, very high where no competition prevails or is probable; very low, down to \$12, even, in some places, where competition has dared to enter, with exceedingly high rates for three-minute conversations on toll lines. In the City of Portland, where the Northeastern is preparing for installation of competitive service, the New England Company (after installing its so-called up-to-date improved central energy system), advertised free telephones for several months, providing the subscriber would contract for a term of years at their standard rates. This was offered to new subscribers only, or those whose old contracts were subject to cancellation or renewal. Their *old* subscribers received no favors whatever, consequently they are earnestly awaiting installation of the Northeastern's service.

The great earnings of the New England Company have been made to appear normal, by frequent increases in the capitalization and watering of its stock, that the public might be fooled, and made to believe that it was earning only 6 per cent. Its attorneys have frequently, in my presence, made the hypocritical, untruthful and deceptive assertions, that competition is unnecessary and could not live, because the old company was earning only 6 per cent. dividends, a statement so easily overturned and punctured that it re-acted with fatal effect. The result of overcapitalization, with the royalty charges demanded by the American Bell Company of its licensees, with its excessively high expense and operating account, is becoming like a millstone, suspended to its balloon-like form and condition.

Its first capitalization was \$200,000, \$50,000 cash, \$150,000 patent rights. Six months later the Bell Telephone Company was incorporated with an authorized capital of \$450,000, \$400,000 of which represented patent rights and \$50,000 only in cash. Six months thereafter, the two companies were combined as the National Bell Telephone Company, which was capitalized at \$850,000; \$650,000 was for patent rights and only \$10,000 cash.

the balance of \$190,000 was represented in apparatus in use. Thus at the beginning was instituted that policy of excessive capitalization, on which the public began, and have ever since been compelled to pay arbitrary and extortionate interest. The collapse of the Erie Telephone Company may be a forerunner of what may happen to the American Telephone and Telegraph Company and some of its licensees. In fact, it has already happened to the Central Union, the Michigan and possibly other licensee companies, where aggressive competition has punctured the fraud. But you can rest assured that the original leaders and owners in the management will be out from under the slump when it occurs.

As applied to the present New England Telephone and Telegraph Company operating in the extreme Northeast, i. e. Maine, New Hampshire, Vermont, and Massachusetts, the last annual report, supplemented by the last statement available for examination, March 26, 1902, shows the capitalization to be \$20,000,000 gross represented in stock, of which \$18,623,500 was outstanding as dividend earning, plus \$4,000,000 in bonds, plus \$863,782.08 in debts. Its reserve was reported to be \$837,823.48, profit and loss including surplus \$1,205,648.33; total liability \$24,630,753.89, which was offset by its asset account, as per its certificate of condition as follows: Real estate \$54,612.28; cash and debts receivable \$2,534,971.15; material, merchandise and stock \$795,659.23; miscellaneous (whatever that may be) \$952,666.67 (quite an item for incidentals not classifiable); last and most important to the public (rental, subscribers and toll payers, as well as prospective investors) was \$20,952,844.55 in patents and franchises, on which a long-suffering, impatiently bled public have been and are paying interest; to which is to be added \$10,000,000 more stock, as recently announced, which will carry the entire capitalization of the New England Telephone and Telegraph Company up to about \$35,000,000, represented by less than 100,000 telephones in service in the four New England States where it operates. A critical examination of the company's statement reveals a condition which competition ought to be satisfied with. For instance, its earnings for 1901 from exchange service are reported as having been \$3,769,844.09; its expense account, outside of dividends paid, was \$4,139,929.79, or over \$300,000 in excess of its earnings from exchange service. Included in the items of expense is \$254,233.89

rental and royalty charge, arbitrarily demanded for use of instruments from its parent, the American Bell Company. Its dividends, with a small surplus for such a large income and amount of business done, came entirely from its toll service revenue and other small incidental items. This condition indicates what will happen when competition gets after this expanded monopoly company. There are already competitive telephone companies in the Northeast, with capital sufficient to develop and extend local exchange and long distance service, and the Northeastern Telephone Company is rapidly placing itself in a position to do the same in its territory.

In Massachusetts they are pushing the development to a profitable and successful position. The automatic companies, using the Strowger secret service exchange system in Fall River and Rhode Island, are making splendid showings considering the short time which they have been operating. I believe that the system there installed is by all means the best one (because of its elimination of that expensive luxury, the telephone girl, and its direct automatic secret service features) with which to beat the old inflated monopoly. Systems, however, are subject to the judgment of each company, and must conform to the local conditions.

Finally, thanking you for your most kind attention and consideration, I will close with the hope that the Independent Telephone Association of the United States of America will continue to grow in influence to an extent that will make it a recognized power for good and for the protection of the public and of its interests in the expansion of that greatest convenience, educator and economical factor in the affairs of life, business and social the telephone (whether it be through the automatic secret service, or the manual non-secret, party line system) so that the citizens of the United States may justly exclaim in the lines of Burns to his benefactor and friend:

"The bridegroom may forget the bride
Was made his wedded wife yestreen;
The monarch may forget the crown
That on his head an hour hath been;
The mother may forget the child
That smiles sae sweetly on her knee;
But I'll remember thee, my friend,
And a' that thou hast done for me."

WHERE WE WERE AND WHERE WE ARE*

By HON. L. J. HACKNEY

WHEN this subject was assigned to me, I concluded, of course, that "Where We Were and Where We Are," referred solely to the telephone situation in the State of Indiana. We Indiana people have got into the way of thinking that we are pretty nearly the whole thing. We think we may modestly claim that Indiana has had a greater development in the Independent telephone business than any other State in the Union. There are many reasons for this. The people of Indiana are so situated with reference to each other that it is not difficult to get them to unite on a business proposition. We sometimes differ as to policy, and occasionally have some pretty warm differences among ourselves in politics, but we are all for Indiana and the interests of the whole country—as we understand them—and do not hesitate to enter into a contest for what we believe to be right at any time.

Then again we have always been a self-reliant people. Few things have come to us for which we have not labored hard, and we have not achieved many victories of any sort without a pretty stubborn fight. We wanted telephone service because we had found out that it was a pretty good thing. We especially wanted it in the small towns and in the country, and in these places, under the old regime, it was impossible for us to obtain it.

Many of the fairly large cities of the country either had no telephone service at all, or very small and indifferent plants. The smaller cities and larger towns of the country had never been supplied with telephone service, nor could they obtain it—no matter what inducements they were prepared to offer.

Such a thing as a telephone to a farmer would have been regarded as a huge joke by the parties then controlling the telephone business in the United States.

The on-coming of the Independent movement changed all this. It had its origin, not so much in the desire of persons to enter

into the telephone business as a business, but from the necessities they felt themselves to be under to have telephone service.

The telephone had come to be acknowledged as a great public, commercial and domestic necessity. People who had knocked at the doors of the Bell Company for ten long years—imploping an opportunity to pay even exorbitant rates for telephone service—gladly made financial contribution to telephone companies which promised them quick service.

It was no trouble anywhere in the country—especially in the West—to get up a telephone company and to have all the stock paid up in a night. That is why the Independent telephone business has the smallest bonded indebtedness of any business in the country. While not what is legally understood as co-operative, it has been, from the beginning, largely a co-operative enterprise.

It is an enterprise in which all the people co-operated to get the thing they wanted, without caring very much as to the details of the co-operation. The man who was willing to put two to five hundred dollars into a telephone company, for the sake of getting a telephone, simply wanted the best service that he could get, at fair rates, and was not at all particular as to whether he was to continue in the company or not. If it was thought desirable that he stay in, he was willing to do it. If the purposes of the company could better be carried out by letting some one else have all or part of his stock, he gave up cheerfully. The result has been the most stupendous business growth that this or any other country has ever seen.

These conditions, which prevailed the country over, were more pronounced in Indiana than anywhere else. An attempt had been made, in the legislature of 1883, to regulate telephone rates, the maximum monthly rate being fixed at \$3.00.

The Bell Company (The Central Union) took offence at this attempt to interfere with its business, and actually tore down and carted away a number of telephone exchanges.

*Paper read at the National Telephone Convention, June 26 1902.

This proceeding outraged the people so much, that although a great many years had gone by they had not ceased to chafe under it. The towns upon which the wrath of the Bell Company had thus been visited, which had been obliged to get along without any kind of telephone service for twelve years, were eager for any opening that would give them an opportunity to supply themselves. They were perfectly willing to fight for what they wanted—provided they could get it at the end of a fight.

The manufacturers of Independent telephone equipment—who at that time sprang up all over the country—gave our people an excellent opportunity, and in a very little while we had twelve or fifteen towns and cities in the State of Indiana with right good Independent exchanges. These exchanges, in turn, enlarged their spheres of usefulness and extended their lines out through the country.

One development brought on another, until there was a great demand for an exchange at our capital city—Indianapolis. The exchange at Indianapolis brought about a demand for long distance toll service between the exchanges throughout the State and the large one at the capital.

It was apparently impossible to get money for these enterprises on the outside. So our people did as they always have done in an emergency of this sort; they went into their own pockets and paid the bills.

The result has been that we now have in the State of Indiana something over 70,000 excellent Independent telephones, every one of which is giving very much better service than any Bell instrument we ever had gave up to the time that the Independent movement was inaugurated.

We have, in addition to that number of telephones, about 6,000 miles of very excellent toll line, and an apparently uncountable number of miles of country lines, designed purely for inter-communication between farmers.

The total indebtedness of our Indiana telephone property does not represent more than five per cent. of the total cost.

We now have a telephone plant in operation, or under construction, in every important city and town in the State, except one—the city of Evansville—and it will not be long before work will be begun there.

Our people have learned a whole lot about the telephone business as they have gone along. One of the great “scare-crows” that was held before the eyes of our people who thought of making investments in Independent telephone property was that no Independent telephone company could be successful without long distance connections. By “long distance connections” was meant an opportunity to talk with New York, Boston, Philadelphia and San Francisco.

This looked, to begin with, like a strong argument. But as we have gone along we have gathered some very valuable statistics on this point. One of the things that we now know, and which we are able to give you as a certainty, from that experience in our State, is that of all the telephone messages originating in the State only $2\frac{1}{2}$ per cent. go out of the State. That is to say, $97\frac{1}{2}$ per cent. of the toll messages originating within the boundaries of Indiana are for points within the State. We find, too, that about 89 per cent. of all telephone messages originating at or terminating at any given center of population go and come from within a radius of 35 miles.

The farmer who talks over the telephone very seldom talks further than to points where he would occasionally have to drive or to go by rail. What he wants is good telephone service over the amount of territory he has to cover. As a general proposition, the farmer who can drive ten miles on a good gravel road in either direction from his farm is not bothering himself very much as to what the conditions of the road may be in any direction outside of that ten miles.

It will be seen from this that the important thing in Independent telephone development is, first, to have good exchanges in the cities and towns, occupying the whole field, and giving telephone service to every one who wants it. Next, we want a good system of toll lines, reaching as far as the business of our towns goes. A town may have a thousand subscribers, and in that town there may not be one man who ever wants to talk to New York, and the chances are that there will not be any one wanting to talk to San Francisco.

But while this is true, the conversations will be frequent within the business zone of the particular town; and within that territory you want not only the best toll lines that you can get, but you want enough of them.

Keep putting on circuits, just as long as the people will patronize them. The opportunity to have quick action on a toll line induces more business. The more business you do, the more you will have to do. The best advertisement that any company can have is the hearty commendation of the people who use its lines.

I have told you, now, briefly, where we were—so far as our State is concerned—and where we are. My own conviction is that the Independent telephone interests in Indiana are impregnable. It is not a pleasant task to say unkind things of one's neighbors and competitors. The Bell companies have made very serious mistakes. These mistakes have been our opportunities. We are not only close to the people, but we are of the people.

The telephone, of necessity, is a domestic institution. It sits by the hearthstone of the family, and it sits there all the time. Its derangements and failure to give good service affect every one in the household—from the six-year-old school boy, who wants to ask his schoolmate, who had to go home, quickly, because he had eaten too many green apples, how he is getting along—up to the grandfather, who, with life's labor nearly done, and whose eyes are reaching out to the great beyond, wants, now and then, to discuss a text with his minister.

We believe in our State that no telephone company can ever succeed without local financial interest and local management. It would be just as easy, and just as sensible, to undertake to run the street and sewer work of an Indiana town from Boston, or to have the school trustees and teachers appointed at New York, as it would be to successfully run a local telephone plant from either of those places.

The telephone is unlike every other public utility. It enters into intimate relations with the people in a way that is not approached by any other industry.

We have (as I have said) in the State of Indiana over 70,000 Independent telephones. If we had all over the State at this time, the same development that we have in the county where we have the largest development, we would have 208,000 telephones; and, if we had, all over the State, the same development that we have in the little town of 2,000 people where we have the greatest development, we would now have 412,000 telephones. We feel quite certain that we will have that many telephones within the next five years.

Our rates are reasonable, and they yield a decent profit. We have not paid, in any instance, exorbitant promotion rates, nor have we filled our stock lists with water.

Our people have come to understand that the telephone business offers a fair and sure return for their money. They believe that it has come to stay, and will always have its highest development in the hands of local people.

I have undertaken to tell you where we were, and to give you some idea of where we are; and I predict that in five years, we will have, within the limits of the State of Indiana, 500,000 telephones.

THE TELEPHONE SITUATION IN THE NORTHWEST*

By C. H. JUDSON.

THE Independent telephone companies of the Northwest, particularly those in the States east of the Rocky Mountains, have made tremendous strides in growth during the past two years. Of the Northwestern States, Wisconsin is older in Independent business, chiefly because of its proximity

to the State of Illinois, which was among the first to go into the Independent business heavily. The Independents began operations in Minnesota as early as 1893 when two or three venturesome individuals established exchanges in towns lying at a considerable distance from the commercial center of the State. These exchanges were not in competition and were soon connected with the Bell systems under traffic arrangements.

*Paper read at the National Telephone Convention, June 25, 1902.

The entire Northwest has been the scene of the same peculiar business methods that have been adopted by irresponsible promoters of Independent telephone companies everywhere. These gentlemen built exclusively but cheaply, and the inhabitants along their lines furnished the funds for their construction; but their day passed three years ago, and they are to-day either gone forever or have become legitimate telephone operators, although principally in other fields.

The field in Minnesota and the two Dakotas has been a good one for the Independents, since the Bell Company operating in these States owns a comparatively small number of exchanges, perhaps not exceeding sixteen in all. It was found that if a good Independent exchange were built along the route of the Bell Company's long distance lines that the Bell people were immediately anxious to secure connections with the new exchange. This, of course, helped to encourage the Independents very greatly, and while the Bell Company has built no new exchanges in the States mentioned within the past five years, every town of 500 inhabitants or more has a telephone system, some of them reaching to the important centers near them over Independent lines exclusively and some part of the way over Independent lines and part of the way over the Bell lines. The policy of the Bell Company being to absorb the lion's share of the receipts, the arrangement has not been altogether satisfactory to the Independents, and new toll lines have been constructed giving strictly Independent connections with the largest Independent exchanges from the outlying districts. Other lines are planned for construction during this and the coming season which will give the center of distribution, that is the Twin Cities of Minneapolis and St. Paul, close connections with all points in the States of Minnesota and North and South Dakota and will link the splendid system of the Wisconsin Independents to it, making a Northwestern Independent system capable of holding its own in competition.

From the report of President Valentine, of the Wisconsin Association, I quote the following statistics as to the Independents in that State:

Exchanges 137; copper metallic toll lines 200 miles; iron metallic toll lines 3,000 miles; iron grounded toll lines 4,000 miles; toll stations 650; telephones in use 23,000; invested capital \$2,316,875.

From the fact that the Minnesota Association has only just been organized it has been impossible to gather complete statistics regarding the business in that State, but from present information they are as follows:

Exchanges 147; miles of long distance toll lines 4,000; miles of circuit 7,000, of which 1,150 miles are copper metallic; toll stations 725; invested capital about \$3,300,000; telephones in use 34,000.

South Dakota shows 103 exchanges; 2,350 miles of toll lines; 450 toll stations, and North Dakota, 89 exchanges, 1,875 miles of toll lines, carrying 2,750 miles of circuits and 350 toll stations.

This showing is indicative of the enthusiasm which prevails in the Northwestern States regarding Independent telephony. Since the Bell Telephone Company came into control of the Northwestern Telephone Exchange Company and the Wisconsin Telephone Company, their licensees in that territory, it has been endeavoring to tie up as many as possible of the Independent exchanges under the Bell license contract; but the terms of which the exchange company agrees irrevocably to sell to the Bell. Very few of the Independent exchange companies have signed the contract. They hold the situation in their own hands, as the long distance connections are of far greater importance to the Bell Company than to them; they are firmly maintaining their position and closing no contracts which will bind them to the Bell corporation. In the natural order of events the Bell Company will make extraordinary efforts to get hold of many of the larger Independent systems, since, if they are cut off from them they will lose very valuable connections in future. Were the Independents in a position to duplicate on short notice the six trunk lines running in various directions throughout the State of Minnesota and into the Dakotas, the Bell people would find themselves without feeders in almost the entire territory, so that it is very clear why they should make the most extraordinary efforts to tie the Independent people to them. There is little danger, as matters stand at present, that such a consummation will come to pass unless inducements far out of the ordinary are made.

The largest Independent company in the Northwest is the Twin City Telephone Company, operating exchanges in Minneapolis and St. Paul. This company entered the field in 1898 under the name of the Mississippi Valley Telephone Company. In 1901 the name was changed to the Twin City Telephone Company and a new organization and ownership was effected. The plants of the Twin City Telephone Company in the two cities are in active competition with the Bell people and are giving a quality of service which probably is not to be excelled in the country. The construction both aerial and underground is of the best, the equipment is of the most up-to-date and efficient pattern, and great care has been exercised to procure only the very best material and apparatus in all of the work.

A large portion of the work in both cities is underground, vitrified clay conduit being used exclusively; something like 1,000,000 feet of conduit is now in. The cable used runs from 200 pairs down, built on the very best specifications, all being No. 19 B. & S. G. double wrapped with paper.

The pole lines of the Twin City Telephone Company are probably the handsomest to be found in the country, Idaho and Washington poles having been used for the most part, all painted uniformly.

The plant of the Twin City Telephone Company comprises seven exchanges in the cities of St. Paul and Minneapolis, the company owning four of its own buildings, all having been constructed within a year, and each being built especially for the purpose in the most convenient and substantial manner. The extraordinary amount of territory covered by the Twin City Telephone Company renders the branch exchange system a clear necessity and the trunking service between the different exchanges has proven very satisfactory. The total ultimate capacity of the switchboards which are now installed is about 26,000 in the two cities. New switchboards will be installed next season adding five or six thousand ultimate.

The growth of the Twin City Telephone Company's business has been along the same line as of all other Independent companies and has even surpassed the expectations of those who are familiar with the demands which might be made.

Nearly 7,000 telephones are now in operation in Minneapolis and St. Paul and orders are being taken and telephones installed at the rate of over 500 per month. The Twin City Telephone Company installs no party lines, and it is therefore for the present cut off from doing business with a large number of the subscribers of the Bell Company who can afford to pay but little for a telephone. This, however, has no effect on its earning power, nor upon its business prospects, since the telephone user who must get along with a telephone at \$1.50 a month is of comparatively little importance in the business field. The company has installed a large number of private switchboard systems and has been compelled to maintain a separate department for the installation and care of this particular branch of the work. The company has invested over \$2,000,000 in the Twin Cities up to the present time.

The Zenith City Telephone Company, of Duluth, is the second largest Independent telephone company in the State of Minnesota. It commenced construction in 1899 and at that time the Bell Company in Duluth had 700 subscribers. At the present time the Zenith City Telephone Company has about 1,900 subscribers in Duluth and is unable to keep pace with the demand. Closely allied with the Zenith City Telephone Company is the People's Telephone Company, of West Superior, Wis., which began business at the same time and has been as prosperous as the Zenith City Company.

These two companies are connected with the Twin City Telephone Company of Minneapolis and St. Paul by a long distance line carrying three No. 10 copper circuits. This line belongs to the Consolidated Telephone and Telegraph Company, a corporation composed of officers of the Twin City Telephone Company. This connecting line is doing a good business and must have made some impression on the American Telephone and Telegraph Company, which it parallels, since immediately upon the completion of the Consolidated line the A. T. & T. charge was cut from 75 cents between the Twin Cities and the head of the Lakes to 40 cents, the Consolidated Company having made its rate considerably lower than the old rate. The company is doing a very satisfactory business and has some twenty-eight stations on its line, which is about 150 miles long, the through business

between the head of the lakes and the Twin Cities being especially good.

The Consolidated Telephone and Telegraph Company has material on the ground for the construction of a line between St. Paul and Eau Claire, connecting at that point with the Wisconsin system and running directly into the exchanges in Eau Claire, Menominee and Chippewa Falls, Wisconsin; also a line running southeast along the river to La Crosse, Winona and intermediate points, perhaps thirty in all. This line will feed a large number of lines which have connections with the Twin Cities and will probably get 100 toll stations and 25 exchanges from these lines. The year 1903 will see the Consolidated Telephone and Telegraph Company's lines extended southwest, west and northwest into the territory which is now connected with the Twin Cities only by Bell lines. These lines will be of the very best copper construction, since the Consolidated Company builds no iron lines except for the occasional accommodation of two or three small exchanges who wish connection among themselves here and here for local business only.

The United Telephone and Telegraph Company, with headquarters in Minneapolis, operates about 250 miles of line running southwest and south from St. Paul, with connections with the Twin City Telephone Company. These lines pass through three of the largest towns in which the Northwestern Telephone Exchange Company has exchanges, and in each of these towns an Independent exchange is doing a successful business. One of these cities, Mankato, Minn., is rebuilding its entire plant this season, installing a new lamp-signal switchboard, and putting in considerable underground construction. The Winona Telephone Company is also very successful, and the La Crosse Telephone Company is well known to be one of the pioneers in the Independent field and is doing remarkably well.

Perhaps the most successful Independent in Wisconsin is the Madison Company. It is well known that in that vicinity the Bell Company does practically no local business, and were the Wisconsin company well supplied with copper circuits running through the State and connecting up the various Independent exchanges, there would be comparatively nothing for the Bell Company to subsist on.

Farmers' lines in Minnesota are taking hold in good shape, one company having over 400 farmers connected with its lines and is increasing its plant constantly. Parts of Wisconsin and Minnesota are as good farmers' line territory as can be found in the country, while other portions, of course, are so thinly settled that it will be some years before much is done.

At the meeting of the Minnesota Independents, recently held in Minneapolis, the constitution adopted contained an important clause and one worthy of mention at this time. It particularly

provides for the elimination of poor construction and the building of toll lines and exchanges in the best possible manner, standardizing the work to the greatest possible extent. The Independent owners in Minnesota have found that poor construction is not satisfactory from an investment standpoint, and this agreement is certain to give the business in our territory a solid basis for future calculation and a high standing among the Independent systems of the country.

Portions of the Northwest demand telephone service because of the long distances between railroad stations and their inaccessibility at certain seasons of the year. In these districts it has been found difficult to make a good line pay at present, but the telephone has been found to be an active agent in the settlement and building up of a new country, and men of means and energy are at hand to furnish what is next to transportation facilities, the most valuable adjunct to frontier and backwoods settlements. Fortunately many of these districts supply plenty of good cedar poles immediately at hand, making the construction to a great degree cheaper than in the more settled districts. The telephone is so important to every class of business and to every kind of community that no one is willing to be without it; even the more educated Indians on the reservations find the telephone to be of some use to them, since the farmers among them have learned that if they have anything to sell they are certain to get better prices when they can ascertain what the markets are at the centers of trade.

The general conclusion that I would have you draw is that the Northwest is not behind the Middle West nor the East in pushing forward the Independent telephone movement. As the same sun shines on the man in Maine and the man in Oregon, and the same desire for the conveniences of life are experienced by both, so it is with the man in the large city and the man in the rural districts. The wheat growers on the rolling prairies of North Dakota, the miners in the cavernous hills of South Dakota, the lumbermen in the pine woods of Northern Minnesota and the dairy farmers of Central and Southern Minnesota, all need the telephone in their daily lives, and it is just as certain as anything human can be that every cross-road and every city and town will soon carry its copper network through these Northwestern States, linking together its people and bringing the Black Hills miners, the great wheat farmers, the lumbermen, the iron and copper men, the manufacturers and all the myriads of others whose lives and interests are mixed with theirs, so close together that it will soon be but the turning of a hand and the lifting of the receiver to talk on Independent lines from the Falls of Minnehaha and St. Anthony to the Pictured Rocks and from the Black Hills and the Bad Lands to the shores of Lake Michigan and the rushing waters of the Sault Ste. Marie.

THE TELEPHONE SITUATION IN THE WEST*

By CHAS. E. WELLS.

THE subject assigned to me is certainly broad enough to suit the most exacting. Even with the Northwestern and Southwestern territory covered by the papers of the gentlemen from Minneapolis and San Antonio, there still remains so much to be covered that in attempting to prepare a paper that would do it justice, I am reminded of the fable of the frog that attempted to emulate the ox. The fable states that the frog "busted." As I have been "busted," to all intents and purposes, ever since I went into the telephone business, the fate of the frog has no terrors for me. Yet, so far as actual information in regard to existing conditions is concerned, this paper will, perforce, be confined to the territory embraced in, and contiguous to, the State of Kansas.

Almost any telephone man (with the healthy imagination common to the species) can tell all about the conditions existing in the telephone field in any part of the universe—providing he is telling it to people who don't know anything about it. I am under the impression, however, that this paper will be read in the presence of men who have been around some, and it will be necessary, therefore, that I keep at least in the vicinity of the facts. This, you will all agree, is a serious handicap, and will have the effect of abridging this paper materially.

From time immemorial, the State of Kansas has received columns of advertising in the Eastern press. Its grasshoppers, its

drouths, its cyclones, its hailstones, its whiskers, its sockless politicians and its Carrie Nations—all these, and much more, have been dilated upon, with charming liberality and great eloquence.

In the publication of these items of breathless interest, some modest facts have been overlooked to a certain extent. For instance, we raise more wheat and fewer illiterate children than any other State on earth, and, as conclusive proof that we are sufficiently civilized to be entitled to self-government, I make the assertion that we have a larger proportion of Independent telephones in use, for each Bell instrument, than any other commonwealth on the map.

The Kansas climate, as you have doubtless heard, is not noted as being particularly adapted to the growth of monopoly in any form. There seems to be something in this prairie air, however, that fosters the Independent telephone business.

At the expiration of the fundamental patents, and the inception of the Independent telephone movement, the Missouri and Kansas Telephone Co. (Bell lessees in this territory) were not very prompt in making extensions and covering their ground.

I believe that this fact (as well as the climate) had something to do with the present wonderful development of the Independent field in this State.

I believe that the first Independent exchange to enter the field in this State was the Topeka plant, which was promoted and built in 1894 and 1895. This plant, however, labored under seri-

*Paper read at the National Independent Convention, June 26, 1902.

ous difficulties from the start. The Harrison apparatus was used. The Bell people had no one else to fight at that time, and were enabled to devote all their attention to it. The common mistake was made of attempting to build a plant with too little capital. They became embarrassed, their securities falling into the hands of the enemy, were foreclosed, and the plant was dismantled.

At the time, the failure of the Topeka plant was felt to be a severe blow to the Independent interests of the State. The jubilation of the enemy found vent in many newspaper articles, all pointing to the figurative placard which they posted round about the confines of the telephone field—"Sacred to the Bell."

The plant above mentioned is the sole and only case of failure of an Independent plant in this territory. The permanent development of the Independent movement here, as is the case generally elsewhere, began in the smaller towns which were not occupied by the Bell exchanges, although the Salina plant—now one of the largest in the State—was built in 1895. This year marked the construction of the first Independent toll line in the State, built by the same company.

From that time on, the movement has gathered momentum, seemingly, with every month. By the close of the year 1899, practically all the territory which would justify development was occupied, and competing exchanges were in operation or in course of construction in many of the larger towns. During the past three years the Bell strongholds have fallen, one by one, until, at this writing, with the exception of Lawrence and Kansas City, Kansas, every city in the State is occupied by the Independent forces. A franchise is now pending in Lawrence, with the prospect of favorable action and the commencement of construction in the next sixty days. The Kansas City (Kansas) plant will, of course, be developed by the Kansas City Home Telephone Company, in connection with the Kansas City, (Mo.) exchange, now building.

When I have stated that the Independent telephone exchanges occupy every town in the State of 1,000 people or over (and many as small as 400 or 500) that statement does not convey a full impression of the real preponderance of the Independent strength.

While the Bell lessees have extended and improved their toll lines during the past six years, I am of the opinion that their exchange telephones have not increased in number, to any material extent.

The remarkable feature of the exchange competition in this territory is the uniform and complete success of the Independent plants, particularly in the central portion of the State. For instance, the Salina Telephone Company, mentioned above, whose exchange was begun in 1895, with some 75 stations, in competition with the Bell exchange of about the same size, after six years of competition, during which time the Bell people have solicited for telephones to be furnished absolutely free, while the Independent plant has maintained its original rates of \$15 and \$30, the Bell now operates some 30 telephones, and the Independents 560. Practically the same conditions obtain in Abilene, Manhattan, Junction City, Ottawa, and numerous other towns of from 5,000 to 10,000 people. Barring some three or four of the larger towns in the eastern part of the State, the Bell people have been practically driven out of the exchange business.

The exchange situation in this territory may be summarized thus: The Bell people have, outside of Kansas City, perhaps half a dozen exchanges worthy of the name, such as Topeka, Atchison, Leavenworth, Wichita and Emporia, aggregating, possibly, 4,000 telephones, with, perhaps, another thousand scattered in the remnants of exchanges at various points.

The Kansas Independent Telephone Association, with a membership of some sixty companies, had in operation, at the time of the last report, nearly 19,000 telephones. It is safe to presume that the present number is not far short of 20,000. This represents as nearly as I am able to compute about 60 per cent. of the total number of Independent instruments in use in the same territory. If these figures are even approximately correct (and I believe them to be conservative) there are at least six Independent telephones in use by operating companies in this territory to every Bell instrument. Many well posted telephone men of the State with whom I have talked on the subject maintain that this proportion is not large enough, and that including the farmer lines (of which we have comparatively few as yet) that there are ten to one.

I am of the opinion that the uniform success of the Inde-

pendent exchanges is due in a considerable measure to the fact that the local Independent toll lines cover the territory so thoroughly. While few distinctively long distance lines have been built by the Independents as yet, there is scarcely a post-office or hamlet that is not reached by their local lines, and the service is uniformly good in a radius of 75 miles, and as all experienced telephone men are aware, this will cover probably 85 per cent. of the telephone tolls from any given point.

Of course, the need of good long distance lines is seriously felt, and is in fact now being supplied quite rapidly. The lack of connection with Kansas City, the commercial center of this territory, has heretofore been a serious check to the construction of long distance lines. Now that the Kansas City plant is assured and under construction, considerable copper metallic line is being constructed, and in my belief, another year will see the construction of a comprehensive system of long distance lines, connecting this territory with Kansas City and the other Missouri River gateways. Of these cities, Kansas City is the "chief stone of the corner" in the system of the Missouri and Kansas Telephone Company. It is the key to the long distance toll business of this territory, and they have fought with desperation to prevent the entrance of a competing exchange, realizing, with the local exchange service in all the surrounding tributary territory in the hands of the Independents; that the entrance of an Independent exchange to Kansas City would spell trouble, both for their exchange and toll earnings. Several proposed opposition plants were strangled at some stage of their promotion, and it had begun to be feared that we would never realize our desire of an Independent exchange in Kansas City. However, during the past season, the matter was taken in hand by Barber and Brailey, and since that time Independent telephone men who are familiar with the reputation of those gentlemen have felt a reasonable assurance that the plant would be built.

That this confidence was well placed is evidenced by the fact that the work has now so far progressed upon the conduit system as to practically insure the completion of the plant within a year.

A new up-to-date central energy system (completed last fall) has arisen upon the ruins of the old Harrison exchange in Topeka, and is rapidly increasing in size, charging the same rates as the Bell. Wichita, the metropolis of Southern Kansas, is now building a model central energy plant, with the prospect that they will begin business with more subscribers than the old company ever had. On the whole, the Independent people of this territory can say to their brethren of the Eastern and Middle States, "We're coming, Father Abraham, some hundred thousand strong."

As stated in the beginning of this paper, I have felt impelled to confine my paper chiefly to Kansas and immediate vicinity, feeling unable to speak intelligently of the conditions in a wider territory.

It may be said, however, that the situation in Oklahoma is much the same as in this State, at least fully as favorable to the Independents. The territory is completely occupied by their exchanges and toll lines, and they are without exception, in a very prosperous condition.

In the State of Nebraska, owing to the fact that the Nebraska Bell Telephone Company were very active in the early days of the Independent movement in extending their toll lines and covering their territory, the Independent movement has not reached the magnitude that it has in this State. However, the Independent companies there are aggressive, and are pushing the war into the enemy's camp. During the past year here has been unusual activity there, and the towns of the State are being rapidly occupied. The Independent telephone people of Iowa are too well known to require any mention at my hands. I helped to organize and build one of the earliest plants in that state, that of the Boone County Telephone Company, and I am personally familiar with most of the plants and prominent Independent men in that State. However, they have a way of doing so much up there in so short a time, that I wouldn't dare to even make a guess at what they have accomplished in the past three years. It may be safely assumed that they are also "coming, Father Abraham."

In conclusion, a word as to the Kansas State Association. While recently organized, it is receiving the cordial support of a great majority of the legitimate operating companies of the State and contiguous territory. It is the intention to make it an organization for the protection of the interests of its members in

fact as well as in name. The loyal support already accorded it by its members has enabled it to accomplish much good in the settlement of differences between the various operating companies, as well as to take steps to thwart schemes directed against the general welfare.

It is my humble opinion that the Independent telephone interests of the United States have much more to fear from internal dissensions and jealousies than from the competition of the Bell Company, and that for that reason harmony should be fostered at all hazards.

A NEW LOCAL ASSOCIATION

THE Eastern Illinois and Western Indiana Telephone Association was organized at Terre Haute, Ind., on June 20. Twenty-four companies were represented.

The following officers were elected:

President, C. R. Duffin, Terre Haute; vice-president, Dr. J. A. Baughman, Neoga, Ill.; secretary, C. W. Shimel, Casey, Ill.; treasurer, J. L. Horney, Clinton.

An advisory board was named as follows: A. L. Keyes, Marshall; John T. Slinkard, Bloomfield, and F. A. Brooks, Charleston. The Committee on Constitution and By-Laws is composed of John Davis, Danville; J. L. Horney, Clinton, and John F. Slinkard, Bloomfield.

The members of the committee to arrange toll accounts are Hale Johnson, of Newton, Ill.; F. M. Boyd, of Rockville, Ind., and John F. Slinkard, of Bloomfield, Ind.

Following were present at the meeting and the companies they represented: Hale Johnson, Newton Telephone Company, Newton, Ill.; J. A. Baughman, president Neoga Telephone and Telegraph

Company, Neoga, Ill.; G. B. Chaney, Toledo Telephone Exchange, Toledo, Ill.; F. N. A. Hoffman, Hoffman Telephone Exchange, Teutopolis, Ill.; W. S. Ashmore, Oakland and Isabel Telephone Company, Oakland, Ill.; F. A. Brooks, Charleston Telephone and Electric Company, Charleston, Ill.; John F. Slinkard, Home Telephone Company, Linton and Bloomfield, Ind.; J. S. Horney, Clinton Telephone Company, Clinton, Ind.; F. M. Boyd, Parke County Telephone Company, Rockville, Ind.; W. W. Harbaugh, Sullivan Telephone Company, Sullivan, Ind.; A. L. Keyes, Wabash Telephone Company, Marshall, Ill.; E. N. McNary, Martinsville Telephone Company, Martinsville, Ill.; C. S. Meyers, Westfield, Ill.; Charles E. Fair, Fair Telephone Company, Chrisman, Ill.; J. F. Grissmore, Farrington City Mutual Company, Charleston, Ill.; C. W. Shimel, Shimel Telephone Company, Casey, Ill.; Charles F. Duffin, Brazil Company, Brazil, Ind.; M. J. Murphy, Brazil Telephone Company, Brazil, Ind.; S. L. Row, Brazil Telephone Company, Brazil, Ind.; George W. Hughes, Dana and Hume Exchange, Dana, Ill.; John Davis, Vermillion County Telephone Company, Danville, Ill.

THE TELEPHONE CLEARING HOUSE*

By A. L. MUTCHINSON

LOOKING at the business of Independent telephone companies from the standpoint of success, their management heretofore has not been all that could be desired, and I am not aware that other states have made much greater advance in this direction than has been made by the companies of Wisconsin.

I repeat here what I have said on several former occasions, that those engaged in Independent telephony are too often men who make the telephone business a side issue in their business affairs, giving it only a small percentage of their attention, and then seeking to apply the same principles which are applied to other businesses.

It is a fact that the dangers and pitfalls which menace the success of the Independent telephone companies in the future are not those due to the competition of the Bell Company and its allies, but rather by those created by men connected with the Independent telephone companies who seek to control their management by rules inapplicable to the telephone business.

It is a business in which there is no room for the narrow-minded, close-fisted pessimist. No matter what capital he may represent or personally control, if he is not broad-gauged enough to grasp the full and complete scope of Independent telephony the quicker he gets out of the business the more he is doing for its success. No business requires the undivided attention of those engaged in it more than does telephony.

With 200 distinct operating companies in Wisconsin, many of them connected with each other, and all forming a single great system, a business is being developed which requires the closest attention to details to make it a complete success. Heretofore the general basis for the division of toll fees has been that each company made its own rates, not only between stations on its own lines, but between stations on its lines and stations on the lines of connecting companies, each company collecting and keeping all fees for all business originating on its own lines. In some instances these arbitrary rates have been such that it would cost the patron more to talk from A to B than it would cost to talk from B to A over the same lines, a condition which has perplexed the patron not a little, since the layman believes that electricity, unlike water, runs up hill as easily as down hill.

But I understand that this meeting of the State Association will adopt a uniform schedule of rates, which shall be applicable at least between the stations of connecting companies, and which should as far as possible be applied by each company between

stations on its own lines, so that there will be a uniformity of rates throughout the State. As Independent telephone companies are not in competition with each other, such an agreement cannot be dubbed a trust, nor can the companies be censured for combining to fix rates.

Having adopted a schedule of rates between existing companies, the question of checking messages, toll charges, messenger fees and other extra charges, and settling balances between connecting companies becomes one of great moment to every company. If each company were to check up and settle its business with every other company in the State over whose lines there have been transmitted through messages, each company would have a herculean task to perform.

There is but one correct way of checking messages and settling accounts between various companies and that is the method adopted by banks in settling their balances with each other. The business between the stations of a single company is settled through the principal office of that company, but to settle the business between the various companies there must be a central office to which each company shall report, which central office shall have authority to settle and adjust all joint business for the various companies.

Realizing the great need of a uniform schedule of rates, and the urgent necessity for a central office for checking messages and adjusting and settling balances between companies, I have anticipated the wants of the companies and have incorporated under the laws of the State of Wisconsin a company known as The State Telephone Clearing Company, whose functions are to receive reports of all business between connecting companies, ascertain their correctness, and adjust and settle the balances at stated periods. Although a complex undertaking for each company to attempt to check and settle its business with every other company, it is but a simple proposition when done through a central clearing company.

The modus operandi is as follows:

The clearing company furnishes each company at cost with two forms of message slips. One from for messages received, the other for messages sent. The two forms are exactly alike except that one is on yellow paper, and the fees are entered under the word "charged;" the other is on green paper and the fees are entered under the word "collected." All entries are to be the same. At the end of each week each station transmits to the clearing company all messages slips for messages passing between it and the station or stations of connecting companies. The clearing company then compares the sending and receiving slip for each message and if correct the fees are apportioned

*Paper read at the Wisconsin Convention, Waupaca, June 26, 1902.

to the several companies over whose lines the message has passed, and each company is credited with its proper amount; if there is a discrepancy in the entries of fees collected and charged, the error is corrected and the station whose slip is wrong is notified to make the correction.

Each station at the end of the month is then able to send its own company a correct statement of all joint business. At the end of the month the clearing company strikes a balance between the various companies reporting to it, sends each a copy of the balance sheet, and draws a sight draft in favor of the company having a balance due it against the company having a balance owing. No money passes through the clearing company, but its drafts in favor of creditor companies must be honored by debtor companies. It is possible through the simplicity of the clearing house scheme to settle the balances between a dozen companies by a single draft.

Not only will each company have its toll business more carefully looked after, but it will also know that it receives every cent it advances for messenger or other extra services. Not only does the clearing company make the work absolutely simple, but it can do the work at a trifling cost compared with the expense incurred by each company in attempting to adjust and settle its own business with that of every other company.

The fee charged by The State Telephone Clearing Company is one cent for each message to each company sharing in the toll charges for such message. Thus if A transmits a message to B, A and B would each share in the toll charges and each would pay the clearing company one cent. If A transmits a message to E via the lines of B, C and D, then A, B, C, D and E would each share in the fees for the message, and each would pay the clearing company one cent.

These fees may be small, they certainly are none too large, but the State Telephone Clearing Company has adopted them and will enter into a written contract with any and all companies in Wisconsin to do the work outlined for a period ending May 1st, 1907.

Each company pays for its message slip forms, which are furnished at actual cost.

The State Telephone Clearing Company is the only company in existence whose sole business is to adjust and settle the business between connecting telephone companies, and I think it will be apparent to all that its existence will fill a want long felt.

The usual parts of a telephone set are mounted in a case *h* with cover *i* on the face of the battery box *f*, in a position to engage the receiver is block *l* hollowed at *m* to the shape of the lower end of the receiver. A similar block *n* is attached to the cover *i*. When the case is closed the two blocks form a collar round the lower part of the receiver, holding it down on the hook.

Anthony Van Wagenen, of Sioux City, Iowa, patents (No. 702,751, June 17, 1902) a transmitter for operating step-by-step

Fig. 1.

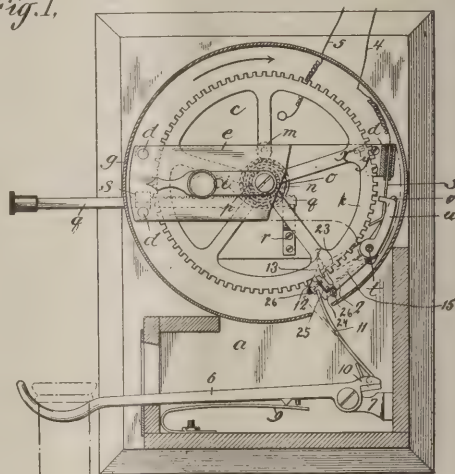


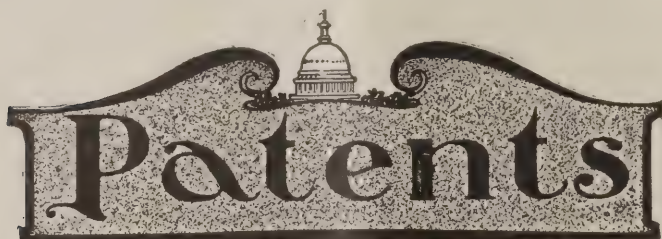
Fig. 2.



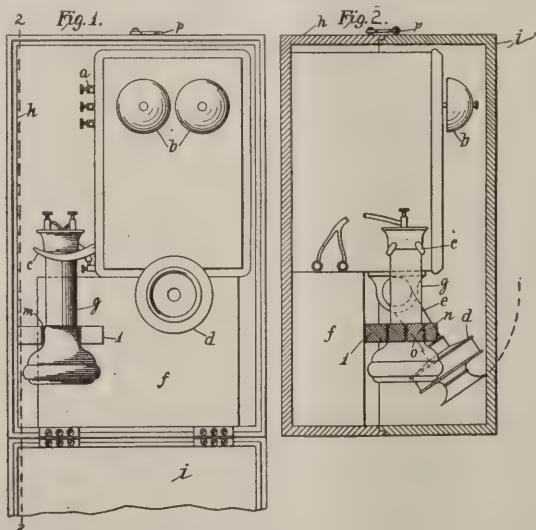
selectors. The instrument is a clock-work device of great complication, and its various features are covered by 25 claims. By setting the pointer to the desired number on the dial a stop-pin is placed in the path of the contact-wheel at the desired point. The spring is then compressed by pushing in the rod *q* and the contact wheel is set in motion and makes the required number of contacts, being arrested at the point determined by the previous setting of the stop. On restoring the receiver to the hook the stop is released by the lever *II* and the contact wheel returns to zero.

CHEAP TELEPHONE ABANDONED

The experiment of the New Orleans telephone company with cheap telephone service has not been satisfactory, and will be abandoned. What is known as the "five-ring" party line has been used to a large extent in that city, for which rental has been only \$1 a month. These "five-ring" lines are really "ten party" lines, and there was little trouble until the line was full, the number on the line at the start being less than half the capacity. When some of the lines, however, had the full complement of ten, there was a lot of trouble. One of the subscribers would be in a hurry to use the telephone, and would find some other subscriber using it. He would wait for a time and then try to get in. Finding that the same parties were conversing about nothing in particular, he would ask to be allowed to use the line for an important message, but would only be laughed at. Then he would complain to the company that he was unable to get the use of the telephone when he wanted it, and declared that he had subscribed for a "five-party" line and that ten were on the line. The company has, therefore, decided to do away with the \$1 monthly service, and substitute \$2 and \$2.50 rates, which, it is thought, will do away with all complaints.



Lambert Schmidt, of Weehawken, N. J., patents (No. 703,004, June 24, 1902) a field telephone set, the principal feature of



which is a clamp which holds the receiver down on the hook when the case is closed, regardless of the position of the case.



The Week's Messages.

Financial

WINCHESTER, IND.—The Eastern Indiana Telephone Company has increased its capital stock \$10,000, making a total of \$15,000.

GRINNELL, IA.—The Interior Telephone Company has increased its capital stock from \$35,000 to \$70,000.

WELLINGTON, KAN.—The Kansds and Oklahoma Telephone Company has filed a mortgage in the register of deeds' office covering its line, built and projected in Kay, Garfield, Grant and Woods counties, Oklahoma, and Sumner and Sedgwick counties, Kansas. The line is to run from Blackwell via Nardin to Medford, thence south through Kremlin, North Enid and Enid in Garfield county, and west to Timberlake and Jett in Woods county. From Medford another branch will be run north to Caldwell, thence by way of Clearwater, Baynesville and Oatville to Wichita.

BOSTON, MASS.—The statement of the Mexican Telegraph and Telephone Company for the quarter ended June 30 (partly estimated) is as follows: Receipts, \$104,500; operating expenses, \$24,500; net earnings, \$80,000; other income, \$13,496; proportion to the Mexican government, \$5,000; dividends, \$47,815; surplus, \$40,681; total surplus, \$1,121,676.

JEFFERSON CITY, MO.—Judge E. R. Hunter and Attorney Langston Bacon, of Kansas City, representing the Equal Taxation League of that city, were here before the State Board of Equalization, urging the board to raise the assessment valuation of the Missouri and Kansas Telephone Company's property in Kansas City and Jackson county. The company, in its return to the board, reports eighty-one miles of poles, valued at \$2,000, which the equal taxers want raised to \$4,500; 3,200 miles of wire, valued at \$19,200, which the equal taxers want increased to \$64,000. The company reports no switchboards and no conduit system.

Judge Hunter and Mr. Bacon strongly insist that the board require the company to report those items which will increase the assessment valuation of the company's property approximately \$250,000 on these two items alone. The company has also failed to report any instruments to the board, and the equal taxers estimate that the company has 7,000 instruments in operation in Jackson county, valued at \$175,000. The total increase asked is approximately \$400,000.

CHILLICOTHE, O.—The Home Telephone Company, of Chillicothe, has increased its capital from \$50,000 to \$100,000.

WELLINGTON, O.—The capital stock of the Wellington Telephone Company has been increased from \$10,000 to \$20,000.

PHILADELPHIA, PA.—The Bell Telephone Company has listed \$999,500 additional capital stock on the Philadelphia Stock Exchange.

New Companies

HOPE, ARK.—Articles of incorporation have been filed by the Hope Telephone Company with a capital stock of \$50,000. The officers are: President, C. McKee; vice president, R. T. Holderness, and secretary, H. T. Chandler.

DOVER, DEL.—Articles of incorporation have been filed here by the Bourbon County Telephone Company to construct, maintain and operate telephone and telegraph lines in Paris County, Ky. Capital stock, \$75,000.

DOVER, DEL.—Articles of incorporation have been filed here by the City Conduit Company, of York, Pa., the incorporators to acquire conduits for telephone, telegraph, and electric light lines; capital, \$100,000.

DOVER, DEL.—Articles of incorporation have been filed here by the Western Telephone and Telegraph Company, of Wilmington, Del., to construct, maintain and operate telephone and telegraph lines. Capital stock, \$500,000.

DOVER, DEL.—Articles of incorporation have been filed here by the American Telephone Company of Wilmington, Del., to manufacture, lease and sell telephone supplies. Capital stock, \$300,000.

DECATUR, ILL.—The farmers of Camarago township, in Douglas County, have organized a telephone company and have begun the erection of a new line. The system will reach from Newman to Tuscalo and will run through Camargo, Murdock and Sargent townships.

WINDSOR, ILL.—The Windsor Mutual Telephone Company, of Windsor, has been incorporated with a capital stock of \$5,000 to operate a telephone system. Incorporators: H. S. Lilly, A. C. Grays, and B. F. Moberley.

INDIANAPOLIS, IND.—Articles of incorporation have been filed here by the McCarter Telephone Company, of Shelby county. Capital stock,

\$900. Directors: William Boring, V. C. Boring, Jacob W. Boring, Calvin L. McNamara and Dougald McDougal.

BLAKESBURG, IA.—Articles of incorporation have been filed in the office of the county recorder of Wapello County by citizens of Blakesburg for the Blakesburg Telephone and Telegraph Company, with a capital stock of \$3,000. The articles of incorporation ask for the right to construct and maintain telephone and telegraph poles and lines in and about the town of Blakesburg. The capital stock of this company is divided into ten shares, and is held by men of Blakesburg and the vicinity. According to the papers for incorporation, the business of the concern is to be transacted by a board of three directors, and the annual election of this board is to be held the fourth Tuesday in June. The present board of directors is William Fritz, Herman Snow and David Jay.

The articles of incorporation are signed by the following: Herman Snow, Walter Abegg, David Jay and William Fritz, and the officers of the company are: President, Herman Snow; vice president, William Fritz, and secretary, David Jay.

HARVEY, IA.—The Victor Mutual Telephone Company has been organized in the eastern part of the county, with a paid-up capital of \$2,000. T. T. McMillan, of Durham, is president; J. B. Lyman, secretary; R. G. Enmel, treasurer; directors, W. E. Foshier, Robert Converse, W. S. Huffman and R. P. Klein. An exchange is to be established here and connection made with Durham, Attica and Knoxville.

MAPLETON, IA.—Articles of incorporation have been filed by the Maple Valley Telephone Company, of Mapleton, with a capital stock of \$5,000. The officers are: President, C. I. Whiting; vice president, W. H. Leathers; secretary, C. H. Sweet; treasurer, T. B. Lutz.

MUSCATINE, IA.—Articles of incorporation have been filed by the Muscatine Central Telephone Company, capitalized at \$10,000. The officers are: President, W. C. Healey; vice president, W. Houseman; secretary, J. Gibbs, and treasurer, F. Healey.

ROWAN, IA.—A local telephone company is being organized here with F. B. Sheldon as president and W. Steffens secretary.

STEAMBOAT ROCK, IA.—A Farmers' Mutual Telephone Company has been organized to operate a line between here and Cleves. Construction work has been started.

BENTON, KY.—A new telephone company has been organized for the purpose of establishing an exchange here. Officers have been elected as follows: R. L. Shemwell, president; R. G. Trase, vice president; J. B. Wyatt, of Briensburg, secretary and treasurer. Thomas A. Miller, of Hardin; Charles E. Smith, of Birmingham; L. J. Gossett, of Briensburg; W. R. Fields, of Sharpe; W. M. Oliver, W. S. Griffith and R. Hayden, of Benton, are the directors. Attorney W. M. Oliver and Mr. L. C. Starks are the promoters, and many citizens of Marshall county are stockholders.

BROKEN BOW, NEB.—Articles of incorporation have been filed for the Central Telephone Company of this place by F. H. Young, F. M. Rublee and others. The capital stock is \$35,000.

COZAD, NEB.—The Cozad Mutual Telephone Company has been organized here with a capital stock of \$25,000. The officers are: President, J. B. Hughes; secretary, S. W. Schooley, and treasurer, G. M. Dillon.

ANDOVER, N. Y.—The Independent Telephone Company may be organized here, to be an unincorporated company for the connection of subscribers in the village.

BUFFALO, N. Y.—The Consolidated Telephone Company, incorporated under the laws of the State of Delaware last summer, with a capital stock of \$10,000,000, is to move here with its headquarters and factory.

This company was organized for the purpose of acquiring and controlling telephone exchanges in New York and other States. The company acts as the controlling or holding company for the telephone exchanges and long-distance lines which it promotes. The Intercean Telegraph and Telephone Company, which is building long-distance lines throughout this state, is controlled by the Consolidated Telephone Company.

The company has established harmonious relations with the Frontier Telephone Company, of this city. In fact, a number of the stockholders of the Frontier Company are also stockholders in the Consolidated Telephone Company. These harmonious relations will enable the new Frontier Company to secure long-distance connections with points not only in this State, but in Pennsylvania, Ohio and other States as Independent companies east of Chicago and St. Louis.

Besides its general offices, the Consolidated Company will move its fac-

THE WEEK'S MESSAGES *Continued*

tory to Buffalo. The factory is now located at Cleveland. The company manufactures telephone supplies of all kinds. The factory in Cleveland employs about 100 men.

Charles E. Austin, Martin Carey and Clark L. Ingham were instrumental in bringing the company to this city. The officers and directors of the company are: President, B. G. Hubbell; first vice-president and treasurer, C. E. Austin; second vice-president, R. M. Parmely, and secretary, J. H. Fuller. Directors, Luther Allen, president Bankers' National Bank, Cleveland; R. M. Parmely, president American Exchange National Bank, Cleveland; C. E. Austin, president Garretson-Mexico Smelting Company, Buffalo; Martin Carey, of Bissell, Carey & Cooke, Buffalo; A. D. Bissell, vice president and manager People's Bank, Buffalo; H. D. Critchfield, general counsel Federal Telephone Company, Cleveland; J. P. Dudley, Standard Oil Company, Buffalo; T. S. Fassett, of Smith, Fassett & Co., North Tonawanda; N. F. Gill, of John Gill & Sons, Cleveland, and B. G. Hubbell, of Cleveland, president of the new company and its subsidiary organizations.

PLEASANT CITY, O.—The Pleasant City Telephone Company is to be organized here. A local exchange is to be installed and new lines built.

HARRISBURG, PA.—Articles of incorporation have been filed by the Valley Construction Company, of Harrisburg, to build, erect, maintain and operate telephone and telegraph lines. Capital stock, \$100,000.

KERSHAW, S. C.—The Kershaw Telephone Company has been incorporated with a capital stock of \$5,000. S. W. Heath, Jno. T. Stevens, of Kershaw, and W. B. Moore, of Yorkville, are the incorporators.

PRINCETON, S. C.—The Princeton Telephone Company has been incorporated by J. B. Hombert, J. T. Cane and C. D. West.

WAXAHACHIE, TEX.—Ellis County Independent Telephone Company, of Waxahachie, has been incorporated with a capital stock of \$100,000. A. E. Shaffer, J. B. Earle and Tony Shaffer are the incorporators.

TALURE, CAL.—The People's Telephone Company is installing residence telephones in the city and county at fifty cents a month.

BROOKLYN, N. Y.—The New York and New Jersey Telephone Company announces a new schedule of rates for Brooklyn by which service will be supplied to subscribers in residences at \$3 and in offices or stores at \$3.50 per month.

Elections

CARLINVILLE, ILL.—At a meeting of the local telephone company, J. T. Darnelle was elected permanent president, Geo. H. Clark secretary, and Ed. Forwood treasurer. A switchboard is to be installed. An assessment of \$3 for each telephone was levied and rules and regulations adopted.

STONE BLUFF, IND.—At a meeting of the Shawnee Telephone Company the following officers were elected: President, J. Meeker; vice president, G. Galloway; secretary and treasurer, F. Z. Helms; superintendent, E. E. Brown.

DETROIT, MICH.—The first annual meeting of the Michigan Telephone Company, since its association with the Bell Company, was held here. The following directors were elected: F. P. Fish, Philip Dexter, W. F. Hutchinson, H. J. Pettingill and Thomas Sherwin, of Boston; Hugh McMillan, of Detroit, and Dudley Waters, of Grand Rapids. The directors will elect officers at another meeting to be held later, probably in Boston.

FOREST CITY, PA.—The officers elected at the meeting of the Northeastern Pennsylvania Telephone Company are: President, G. S. Tingley; vice president, E. A. Burns; secretary and general manager, W. H. Kessler, and treasurer, F. Benson.

PITTSBURG, PA.—D. McK. Lloyd and William G. Park, of Pittsburgh, and F. H. Seely, of Altoona, and James B. Krause, of Williamsport, have been elected new directors of the United Telephone and Telegraph Company, together with H. C. Harner, of Lancaster.

SHICKSHINNY, PA.—At the meeting of the Lower Luzerne Telephone and Supply Company the directors elected J. J. Robbins, of Salem, president; B. C. Allen, of Wilkes-Barre, treasurer, and R. M. Tubbs, secretary and general manager. Material is being secured to begin the construction of the line at once.

Franchises

FRESNO, CAL.—The Pioneer Trust and Investment Company, of Los Angeles, which has been granted a telephone franchise in Oakland, has applied for a twenty-five-year franchise to operate a line here.

GALESBURG, ILL.—The Victoria and Altona Telephone Company has petitioned for a franchise for a telephone line on the public highway of Victoria, Copley and Walnut Grove townships.

GALESBURG, ILL.—The American Telephone and Telegraph Company of Illinois, by Charles D. M. Cole, superintendent, has applied for a franchise granting the right, privilege and authority to construct, operate and maintain its lines of telephone and telegraph, including the necessary poles, wires and fixtures, upon, along, and over the highways of Knox county, Illinois, and that the said company, its successors and assigns may be allowed permission to attach its wires to such bridges belonging to the said county

as are necessary for the proper and safe construction of the said company's lines, and your petitioner will ever pray, etc.

ANDERSON, IND.—The county commissioners have granted a franchise to the Indiana Telephone and Telegraph Company to erect poles and string wires along certain highways in the county.

NATICK, MASS.—The New England Telephone and Telegraph Company has petitioned the selectmen for a franchise to lay conduits in certain streets. A hearing will be given by the board July 10.

WEST STOCKBRIDGE, MASS.—The South Berkshire Telephone and Telegraph Company has petitioned the selectmen for a franchise to build a line from Great Barrington to this village.

PULASKI, N. Y.—W. S. James, of Watertown, representing the American Telephone and Telegraph Company, was here in the interest of that concern. A special meeting of the board of trustees was held at which a franchise was granted the company to extend its wires through the streets of this village. The Empire State Telephone Company, which operates a line in this section, will, it is understood, soon reconstruct its lines and string the wires on the poles to be erected by the American Company. A force of men is now engaged in setting the poles for the last named company at Watertown and will continue the work without interruption until the end of the route is reached. It is quite probable that a direct line will be constructed between the Garland City and Pulaski and on to Oswego and Syracuse, thus giving an improved service between the points named.

CLEVELAND, O.—The city council will be called upon to act on a communication from the directors of the Cuyahoga Telephone Company requesting a change in the franchise conditions. The directors state that under the maximum rate which the present franchise permits them to charge an increasing business cannot be done upon a profitable basis. The rate now charged is \$3 a month for residence telephones and \$4 per month for business houses.

MAUCH CHUNK, PA.—An ordinance granting permission to the Carbon Telephone Company, its successors and assigns, to construct, maintain and operate a telephone line on certain streets and alleys of the borough of East Mauch Chunk, has been passed by the town council.

MEDFORD, ORE.—The Sunset Telephone and Telegraph Company has been granted a ten-year franchise. The company is to pay the city \$20 a year and give the city free service to the different city offices, and also to allow the city the use of the company's poles for electric light and fire-alarm wires.

AVOCA, PA.—The Consolidated Telephone Company has been granted a franchise to extend its system through Avoca and is making rapid progress in placing poles through the town.

CHESTER, PA.—The Keystone Telephone Company some time ago was given permission to erect poles and string wires through the borough, and now has been granted an extension of sixty days. The work was to have been finished by the first of July, but the company seeing that it could not accomplish the work in the limited time, asked for an extension until September 1. The officers have agreed to place octagon-shape poles instead of the unsightly old-time poles if the borough officials would grant them the extra time asked for, and this was acceded to.

CLEARFIELD, PA.—The Clearfield Telephone Company has been granted rights of way by the councils of Clearfield and Curwensville. Osceola, Houtzdale and other boroughs will also grant rights of way for building the system. The company proposes to furnish service free to all subscribers throughout the county. Rates are \$1.50 per month for town residence or farmer, and \$2.50 per month for business places.

DELTA, PA.—At the recent meeting of the Delta borough council the privilege of using the highways of that borough was granted the Pennsylvania Telephone Company to erect poles and string its wires. The work is to be done under the supervision of the highway committee.

Underground

DAVENPORT, IA.—The Union Electric Telegraph and Telephone Company has submitted the plans for the underground conduits and the overhead system of wiring which it expects soon to install. The plans are at the office of the board of public works for inspection.

Combinations

GREELEY, COL.—The Northern Colorado Independent Telephone Company, capitalized at \$500,000, now controls the Greeley Independent Telephone Company. Lines will be constructed throughout the northern part of the State.

ROCHESTER, N. Y.—Plans are practically perfected for the consolidation of the Independent telephone lines in Wayne county into one concern, which is to re-equip and extend the lines until they embrace every town and village of the county. The moving spirit in the consolidation is Charles A. Lux, of Clyde. Recently Mr. Lux and his business associates became owners of a controlling interest in the Lyons Telephone Company and the Wayne County Telephone Company, and they met with the directors of these companies and decided upon the consolidation.

THE WEEK'S MESSAGES *Continued.*

The company, which is to succeed the Independent concerns, will be capitalized at \$50,000, an increase of \$40,000 over the capitalization of the Wayne Telephone Company. In Lyons cables will take the place of the wires at present in use, and an all-night service will be maintained. This change will be adopted in Clyde, Newark and all the larger villages. Through the county generally a complete metallic circuit will be installed and other improvements made.

CLEVELAND, O.—The Willoughby Telephone Company, one of the Everett-Moore properties, has been sold. The consideration was in the neighborhood of \$10,000. The company has 150 telephones in operation. The purchasers are a company of Willoughby merchants, headed by Fred Storm.

Construction

DEL REY, CAL.—A farmers' telephone line is to be installed near Del Rey. Several of the farmers have purchased the necessary outfit and will use the barbed wire fences as the medium of transmitting the electric current. These telephones are working successfully in Merced county and in other localities, but it is believed that this is the first to be introduced into this county.

WILMINGTON, DEL.—The Delaware and Atlantic Telegraph and Telephone Company has a force at work in Newark extending the service there. Other extensions are being made by the company in different directions.

HILLSBORO, ILL.—The Mutual Telephone Company having been granted a permit will begin the work of erecting poles and stringing wires.

MUNCIE, IND.—The Gas Belt Construction Company, which has the contract for putting in the new telephone system for the Delaware and Madison Counties Telephone Company, has ordered 60,000 feet of cable, the amount of cable estimated to be necessary for the Muncie system. The underground conduits are entirely completed and the cables will be drawn through as soon as they are received. Work on the ground line is progressing rapidly and two-thirds of the poles are now in position. The company has received 1,000 telephones, and a second shipment will arrive later. The building which the Delaware-Madison Company is constructing is to be completed by August 1. The building will contain the general offices, switchboards, batteries, and all necessary equipments of the system. It will be three stories in height and will cost \$15,000 when completed. The toll lines from Anderson to Alexandria will be connected and in working order within the next two weeks, when construction of the toll lines from Anderson to Muncie will be started. From Muncie the line will extend on to Eaton.

George F. Trier, secretary of the Gas Belt Construction Company, which is also putting in a new telephone system for the Delaware and Madison Counties' Telephone Company in Elwood, said the plant there would be entirely completed within a month. The cables are now being drawn and the switchboard will be in position within two weeks.

ALBANY, KY.—A new telephone line will be erected from Albany to Burkesville. A line may also be extended to Monticello.

KEARNEY, NEB.—The material is on hand, and construction work has been started by the Home Telephone Company of this city, for the line between Shelton and Gibbon. Mr. Stadelman has the construction contract.

TRENTON, N. J.—The switchboard to be used in the plant of the Interstate Telephone Company is now being placed in position. The board is capable of operating 3,000 telephones. Besides the general switchboard there will be a separate board for the toll lines, which will also operate the long distance service. The company has ordered 2,000 telephones, which, in a week or so, will be distributed to all subscribers, who number at present about 1,300. The company expects to have the system in this city in operation by August. The work of laying conduits is almost completed, and poles are now being erected on the outskirts.

SHERBURNE, N. Y.—The local telephone line conducted by Shepard & Sholes of this place, is being extended from Smyrna to North Otselic.

LEEDS, N. D.—A private telephone system is being put in at Leeds, and a company may be organized.

WILLOW CITY, N. D.—A local telephone system is to be installed as soon as poles can be secured.

GAYVILLE, S. D.—The Gayville Rural Telephone Company is rushing work on its plant. The organization consists of President James Fargo, Secretary N. J. Lund, Treasurer C. N. Johnson, and twelve others, all residing south of Gayville. The material is on the ground, and the company is busy erecting its lines and poles. There will, when complete, be nine miles of main wire and five miles of branch wire.

JACKSON, TENN.—The contract for the installation of the plant of the Jackson Home Telephone Company, composed of Wilkes-Barre people, among whom are Robert T. Pettebone, Dr. F. C. Johnson, A. D. Hay, C. Frank Brobst, Dr. A. C. Shoemaker, Frank P. Hopper, John E. Nugent, Joseph D. Lloyd, Joseph L. Dunn, Senator William Drury and E. R. Pettebone, has been awarded to a Chicago firm. About \$125,000 is involved in the deal. The construction work will begin at once. The company has 1,000 subscribers to start with, who have signed for five years. The franchise is perpetual. The system will be central energy full metallic circuit.

BRENNHAM, TEX.—An exchange is to be opened here by the Commercial Telephone Company. A force of linemen is engaged in stringing the wire.

FORT WORTH, TEX.—The Fort Worth Telephone Company having secured a franchise will have engineers here for the purpose of drafting plans for the new central energy system which it is proposed to put in. The company will be capitalized for \$300,000, and will start service with 2,000 subscribers. The switchboard has an ultimate capacity of 3,000 lines. The work of installing the plant will require several months, and will not be completed during the present year. The underground conduit work will require much time, labor and expense, but the promoters are enthusiastic in their determination to push the proposition.

FON DU LAC, WIS.—The Little Wolf Telephone Company has about concluded arrangements for the installation of a telephone exchange at North Fond du Lac. A large amount of the material is on the ground, and work of constructing the line will be commenced immediately. Heretofore the company has been using the trolley poles and in installing an exchange it will be necessary to construct a private line of poles from this city to North Fond du Lac. Connections will be made within a few weeks, and service will be given to about fifty subscribers.

Miscellaneous

GALESBURG, ILL.—The Galesburg Union Telephone Company has agreed to furnish telephones in the Knox County Court House at \$1.50 per month.

ELKHART, IND.—The Chicago Telephone Supply Company will establish a factory here September 1, and will employ 250 people.

LOGANSPOUT, IND.—The Home Telephone Company now gives direct service to Burnettsville, Idaville, Monticello, Monon, Kentland, Goodland, Wolcott, Seafeld and other points west.

OLIN, IA.—The Jones County Telephone Company contemplates establishing an exchange here, and B. H. Miller and H. F. Camp, of Anamosa, were here in the interest of the company.

SIOUX CITY, IA.—At a meeting of the Clark Automatic Telephone Switchboard Company at Providence, R. I., it was decided to establish a branch at Sioux City in charge of J. L. Putnam, of Providence, to supply small towns hereabout with the patent. Providence men have been elected officers, with E. L. Freeman, president; J. W. Phillips, vice-president; A. S. Clarke, secretary, and M. E. Torrey, treasurer.

ATCHISON, KAS.—The rural telephone line in the Bendena neighborhood has been completed. The line will be extended to Doniphan where it will be connected with the Atchison Independent plant. There are about thirty farmers on the rural line running out of Bendena.

LOUISVILLE, KY.—The Louisville Home Telephone Company, A. L. Tetu, general manager is now giving service, with 2,000 lines connected.

PLAINVIEW, MINN.—The Dwelle Telephone Company is installing a new switchboard with a capacity of one hundred lines.

ST. PAUL, MINN.—Until the Northwestern Telephone Company agrees to recognize the 5 per cent. gross earnings provision of the new charter or the supreme court decrees otherwise in a case now before it, involving this one point, there will be no more extensions of the company's lines or system in St. Paul.

HAMBURG, MO.—The telephone line between Hamburg and Weldon Spring has been completed.

MANCHESTER, N. H.—The Amoskeag Manufacturing Company of Manchester, is about to install in its plant one of the largest private telephone systems in use anywhere. The system will have about 40 stations. There will be no central.

PENN YAN, N. Y.—A meeting of the residents of Crosby and Barrington who were interested in telephone matters was held, and arrangements made for the erection of an Independent line connecting these points with Penn Yan.

PINE BUSH, N. Y.—The Orange County Telephone Company has its line to Pine Bush completed, and in operation.

WOLCOTT, N. Y.—The Wolcott Board of Trade is now negotiating with a telephone company to induce it to run a telephone line from Savannah to Wolcott, running through South Butler, Butler Center, Spring Lake, and possibly extending to North Wolcott. Secretary Edward T. Brom is now corresponding with two companies in regard to having the line opened at once.

CLEVELAND, O.—Terms of the option granted to Edward L. Barber and George J. Hoffman on 12,000 shares of common stock and 2,000 shares of preferred of the United States Telephone Company have been announced. It has been agreed that all of the common stock sold, together with that remaining in the hands of the Federal Telephone Company, shall be pooled for a period of three years from July 1, 1902, for the purpose of sale, and that a sales committee shall be provided, and that this sales committee shall

THE WEEK'S MESSAGES Continued

have full power to sell 40 per cent. of the stock subject to the following limitations: That on or before July 1, 1904, stock may be sold at not less than 50 cents on the dollar par value, and that thereafter and on or before July 1, 1905, stock may be sold at not less than 60 cents on the dollar par value. The proceeds of any sale is to be distributed pro rata among all the holders of stock so pooled. Any part or all of the stock over 40 per cent. may be sold as above provided if approved by three-fourths of the entire board of directors.

TOLEDO, O.—The Toledo Home Telephone Company will shortly start service for about 4,500 of its subscribers. The remainder will be given service just as rapidly as possible, and by July 15, the plant will be in full operation.

EUGENE, OREG.—C. H. Holden, of Florence, one of the principal shareholders in the Eugene and Florence Telephone Company which proposes to erect a telephone line from Eugene to Florence, is in the city to ascertain what support from a financial point of view the people of Eugene will give the project. Mr. Holden stated that the company wants Eugene to subscribe \$1,000 toward the erection of the line, the total cost to be about \$4,000, of which the people of Florence and along the proposed route have put up \$1,000, and the shareholders in the company the remaining \$2,000. If the money is subscribed, the company agrees to complete the line and have it in operation by November 1, 1902, at which time the amounts subscribed will become due. It is stipulated in the subscription paper that the company will issue to subscribers coupons to the amount subscribed, and the holders of these coupons are entitled to service over the line to the value of the said amounts. Stations will be established at every postoffice along the line which are as follows: Elmira, Hale, Walton, Glentena, Meadow, Lake Creek, Mapleton, Acme and Florence.

PHILADELPHIA, PA.—Keystone Telephone officials report that the company has now installed over 5,000 telephones and is therefore under its contracts entitled to commence charging for the service.

RICHMOND, VA.—The Mutual Telephone Company has added a section to the switchboard in the central office here, which will admit of the addition of 300 new lines to its present list of 600.

Personal

MUSCATINE, IA.—Walter M. Wiggins, formerly manager of the telephone company at Kohoka, has been appointed manager of the local exchange of the Mississippi Valley Telephone Company.

COLUMBUS, O.—B. H. Miller, of Springfield, has been appointed to succeed W. W. Johnson as local manager of the Central Union Telephone Company.

HARRISBURG, PA.—J. L. Gaynor, of New York, formerly electrician for the Pennsylvania Telephone Company at this place, has been appointed assistant engineer in the company's engineering department, with headquarters here.

TRADE NOTES

G. M. GEST, the electric subway contractor of New York and Cincinnati, has now in his employ 1,000 men. This shows how the underground construction branch of electricity is growing. Mr. Gest was formerly a general contractor, but, realizing the future of conduit work, decided to specialize his business, and engaged some of the best engineers and skilled workmen in the electric light and telephone branches. To-day he is constructing in several States. His most notable work at present is the laying of one million feet of duct in Cincinnati. His New York branch has been so successful that before long he intends to open a Western office in Chicago.

THE CHICAGO PAY STATION COMPANY are manufacturing an improved type of mechanical coin collecting apparatus, which, by means of a special mounting plate, can be attached to any telephone.

The construction of these machines is very simple, there being few parts, and all of the strongest design. As there is practically nothing to get out of order, maintenance is reduced to the minimum.

The five-cent cathedral gong signal has their patent muffler, by the use of which much annoyance and five or more seconds on each call is saved.

There is a rejector pocket which, in case a coin is dropped in the wrong slot, immediately returns the coin to the patron.

The case is cast from one piece of soft gray iron, and the cash drawer fits in flush with the front, making it impossible to pry open. The combination lock used is very secure, and cannot be opened without a knowledge of the combination.

With these special features it can be seen that this coin-collecting machine is a very desirable piece of apparatus. Although the initial cost is somewhat greater, telephone companies are adopting them in preference to others, as the low cost for maintenance about evens matters up.

CLARK & MILLS, of Boston, have a battery on the market which they claim is unequaled for telephone switchboard work. A glance at the chief features of the battery will be interesting.

The "Excello" battery, as it is called, is of an improved gravity type, in combination with the original Daniell cell, having for its containing cell a heavy glass jar twelve inches high and six inches inside diameter. The copper element—a band three inches wide extending about the circumference of the jar half way from top to bottom—is supported by copper legs. Eight pounds of bluestone are placed in the jar; then a specially prepared porous cup having top flanged so as to rest on edge of jar with a heavy cast mercury zinc, is placed in position, and after filling the cup and jar with water a soft tight-fitting rubber cap is placed over all, ensuring a clean battery.

With no creeping of salts, the bulk of the labor necessary with most batteries is eliminated, and in actual daily use in very exacting work this battery has run 18 months without care or attention. The zinc weighs 2½ lbs., and with capacity for 8 lbs. of bluestone in the jar, and the feature of cleanliness it is a long-lived reliable battery that only needs to be "set up and let alone."

PLANTS FOR SALE

TELEPHONE PLANT FOR SALE—160 telephones, 100 miles of toll lines; excellent opportunity for extending business; will sell for \$12,000; pays 15 per cent. net on this amount. Address TELEPHONE CO., care of AMERICAN TELEPHONE JOURNAL.

WANTED

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISSELL CO., Toledo, Ohio.

A FEW more men wanted to take advantage of our gilt-edged offer: 5,000 Toll Tickets printed, \$1.75. Independent Telephone Printers: THE SUN-PRESS, Stockbridge, Mich.

MANAGER OR ASSISTANT.—Wanted a position by a man of experience in construction, switchboard work, in an exchange of 150 to 400 subscribers. Can give good references. J. E. THURSTON, North Vernon, Ind.

THOROUGH, all 'round telephone man wants position. Eight years' experience. Understands all telephone work connected with the average exchange. Am at present manager of an exchange of 100 subscribers. Best of references. Address G., P. O. Box 125, Monroe, Ga.

POSITION as assistant and inspector of a small exchange of from 200 to 500 subscribers. Experienced at switchboard and telephone repairing. Also experienced in overhead construction. Good reference, JOHN R. NORRIS, North Vernon, Ind.

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MEASURED SERVICE AS A TELEPHONE DEVELOPER.

By F. C. REDFIELD.

This article received Second award in the American Telephone Journal Prize Contest.

IN my opinion, measured service as a factor in increasing the development of the telephone has not received from the Independent companies the attention which its importance demands. Having been associated with the Bell people for many years in the highest executive offices, where a general view of the whole field may be had, I am free to say that measured service in one form or another is largely responsible for the remarkable



BY F. C. REDFIELD.

growth shown by the Bell companies during the past five years. During this period, there has been an increase of approximately 66 2-3 per cent. in the total subscription list, and of that large addition, 75 per cent has been due to message rates in spite of the measured service rates being as abnormally high in proportion to service rendered as are the Bell flat rates. Now if the Bell companies can make such a showing after having been in business many years and presumably having pretty thoroughly canvassed their territories before these rates were adopted, what can the Independent people do with the same class of service

business for less money than the Bell people and earn dividends; they are not handicapped by having to earn dividends on millions of dollars of watered stock, by having to pay tribute to a gigantic parent company, by having to support a large political following, whose demands amount to little short of blackmail, nor by having to support an army of heads of unnecessary departments. Being free from all these objectionable features and having nothing but legitimate expense, the Independents are in a position to quote some very attractive measured service rates; but, how are they to go at it? What rates can be made and ensure a profit? It will not do to guess at it; there must be some basis to work on. This basis is not difficult to arrive at, as will be shown below.

Undoubtedly very few of the Independent companies operating in the United States know the actual cost to them of making a single connection, yet it is as important to them that this should be known as that the cost per pound of sugar should be known to a grocer; in fact, it is absolutely necessary to know this cost to figure measured service rates intelligently. The Bell people know it, for every exchange of any importance operated by them. To get at this cost the first thing necessary is to have a so-called "peg count" or record kept of the number of calls answered by each operator both night and day. This should be kept for three consecutive days, taking the first three days of one week and the last three days of the next; otherwise it will not be possible to get a fair average, as the early part of the week is more apt to be busy than the latter part. It would be well to keep this work up for one month, as the early part of the month is more apt to be busy than the latter part. Having got these figures, the next step is to get at the cost of running the plant. Presumably all companies know this cost. It should include everything, rent, light, heat, taxes, insurance, operating, maintenance, etc., but not construction. To all this should be added a 6 per cent. dividend on the capital stock of the company and an annual depreciation of 10 per cent. on aerial construction (including everything above the ground) and 5 per cent on underground construction. Many Independent com-

panies make no account of depreciation, but pay large dividends. In this they are making a mistake; they are simply fooling themselves and their stockholders and will realize it some day. It is conservative management to figure depreciation as above, and in all cases it should be taken into account in figuring actual cost of doing business. Having got at the total cost of doing business for one year, as above, it is an easy matter, of course, to determine how much it will be necessary to earn per day to make up this total, having got the average number of calls per day it is easy to determine what must be charged per call to earn the required amount. The figures will be found to vary in different exchanges; in the smaller exchanges the cost per call will be found to be more than in the larger ones, within certain limits, and will steadily decrease up to a certain point as the number of subscribers increases. This is due to the fact that the larger number of subscribers the larger will be the average number of calls per subscriber. This average should be kept as high as possible by keeping the rates so low that no subscriber will hesitate to use the service freely. Previous to the introduction of measured service the average number of calls per day per subscriber throughout the Bell system in the United States was eight. Since this service was introduced it has dropped to six; this is probably due to the small user curtailing his calls owing to the abnormally high price per call. Measured service acts as a stimulus to the business from the fact that it gives the small user a chance to get telephone service at a price more nearly commensurate with the service rendered, although under Bell rule, owing to the high minimum rates charged, he still pays for service he does not get. It is obviously an injustice to charge the same rental for two telephones, one of which is used but three times per day, while the other may be used twenty, and in no other line of business is such a system followed. What gas or electric light company would think of furnishing one patron with three lights and another with twenty and charging both the same price?

Now the question arises, is it not possible to carry measured service still further than the Bell people have and give a subscriber just what he pays for, no more and no less, and this at a price so low that the subscription list shall be increased at least threefold, thereby making the service of more value to all parties concerned? I maintain that it is, and that the price can be made so low that the use of the telephone will become well nigh universal; in fact, I believe that the day is not far distant when measured service shall supersede flat rates entirely. I advocate trying the experiment of running an exchange on the same basis as a gas or electric light company is run. This, while not applicable to an exchange already installed, is perfectly practicable for a contemplated exchange. For instance, a company installs a switchboard and central office apparatus, builds lines radiating therefrom to all parts of the city or town, the same as a gas company builds its plant and lays its pipes. Now a party desiring telephone service goes to the central office, selects such apparatus as best suits his fancy and pocketbook, and pays for the same. He also pays for installation, as he would for piping or wiring his store or house. Now the company owns the lines and switching apparatus, and the subscribers own the rest. The company simply does the switching as directed by the subscribers, collecting a small toll for each connection, record of which is kept at each subscriber's station by a register or meter on which all outward connections are recorded.

Let us see what can be done with such a system. We will assume that we have an exchange of five hundred subscribers; the construction being largely aerial; the cost of switchboard and lines should not exceed thirty dollars per station, or a total

of fifteen thousand dollars. Taking this as a basis the following will be found to be a very close estimate of the cost of running such a plant:

Manager	\$1,000.00
Chief Operator and Bookkeeper.....	360.00
Day Operators, 5 at \$300 each.....	1,500.00
Night Operator.....	480.00
Combination Men, 2 at \$720.00 each.....	1,440.00
Rent (including heat).....	300.00
Light	100.00
Taxes	200.00
Miscellaneous	150.00
Maintenance	500.00
Depreciation, 10 per cent. on \$15,000.....	1,500.00
Dividend, 6 per cent. on \$15,000.....	900.00
Total	\$8,430.00

As we have no means of knowing what the average number of calls per subscriber per day will be, the only thing we can do is to take Bell figures as a basis. Assuming that we get but

six, which is very low for an exchange of this size (nine being probably more nearly correct) we should have a total of 3,000 per day or 900,000 per year of 300 days. If we were to collect a switching charge of one cent per call the revenue would be sufficient to pay all the above charges and leave a surplus of \$570.00, or if it developed that the average number of calls for subscribers was as high as eight, the revenue would be sufficient to pay all the above charges and leave a surplus of \$3,570.00.

Should it develop that there were many would-be subscribers who could not afford to buy apparatus, I would say to such prospective subscribers: "We will furnish you with apparatus and charge you a small annual rental sufficient to pay a fair return on cost of instruments and installing same, or we will furnish and install apparatus for which you will pay in small monthly payments, said apparatus to become your property as soon as paid for." In addition to these charges the regular switching charge for each connection would be made.

The importance of this or any other idea by which the subscription list of an exchange may be largely increased can hardly be overestimated as the value of the service to a subscriber depends entirely upon the number of people that may be reached.

TOLL RATES AND TOLL DIVISION*

By H. C. WINTER

THIS subject, though of prime importance and vital concern to all telephone companies and subscribers, is one that by its nature is abstract and dry, and it is a difficult undertaking to make it interesting. However, there must be something sobering to counteract and offset the social, jovial and pleasure side of convention gatherings, and this paper will, no doubt, serve that purpose well.

The establishment of a common schedule or basis by which to regulate combination tolls and ensure an equitable division of that toll among the companies transmitting such messages is specifically stated in the Constitution of our Association as one of the objects of its organization. At the first meeting, held at Weyauwega some two years ago, this was the subject that received the most prominent and general discussion, and although no action was then taken it was the sense of the Convention that this was one of the problems calling most strongly for associated action. At the two following meetings this subject was again discussed at considerable length and a committee of three was appointed to consider and report a plan for regulating and dividing such toll rates, but the committee was unable to agree upon a satisfactory plan and no report was adopted. In the legislature in session at the time of the Convention a bill had been introduced compelling the different telephone companies to connect with each other and imposing heavy penalties for refusal. The Association adopted a resolution strongly opposing any such legislation and the Bell Company also opposed the bill, and it failed of passage. Had such bill passed you would not now be obliged to listen to this effort on this subject.

At the La Crosse meeting, a year ago, a resolution was adopted recommending that a committee of three be appointed to formulate a schedule of toll rates and a division thereof between connecting companies, that an agreement be prepared upon the basis of such schedule, and that an effort be made to secure the agreement of all Independent companies in the State thereto, to commence and take effect at a stated time. This committee made its report at the last Milwaukee convention and its plan was the same as that adopted at a meeting of the Executive Committee at Weyauwega, March 26, 1901, which was as follows: Such combination toll to be two-thirds of the sum of the local tolls and to be divided on the basis of one-half of the sum of the air line and pole line distances between the entering and outgoing stations of the companies transmitting such message, exchanges through which said message passed being taken as equivalent to three miles of line. A committee of six was then appointed to further consider this report and make a new report the next day. At that time the committee was not ready to present its report, and requested further time to consider the subject, which was granted, and the committee was directed to report at this meeting. Thus the association has resolved and resolved, and committees have reported and considered and again reported, but nothing tangible has yet been accomplished. The hope of starting a discussion

that will crystallize into a substantial and practical plan is the motive of this article.

There are two distinct parts to this subject; the fixing of the rate, and the division of the toll among the different companies handling the message. Almost the first question that suggests itself in considering the rate is whether the charge be based on the distance, and, if so, on the pole line or on the air line distance between the stations.

The cost of transmitting a message is made up of two distinct factors—the operating expense and the construction expense. The operating expense comprises the expense of the exchange or station, operator's service, the accounting and collecting of the toll, etc., and this expense is only very indirectly and practically not at all dependent upon the distance. Hence the cost of transmitting a telephone message usually does not vary with the distance, as it involves no more expense or trouble to transmit a message from A to C than it does from A to B, even if C is twice as distant from A as B is, assuming of course that their stations are in the same circuit. Stating it abstractly, the operating cost of transmitting a message over a portion of a circuit is exactly the same as transmitting it over the entire length of the circuit. The operating expense of a message, however, does depend upon the distance to the extent that additional distance involves handling by additional exchanges and circuits, but to that extent only.

By the second factor of cost of a message, the construction expense of transmission, an awkward expression perhaps, is meant a term that can be estimated only approximately. It means a quantity derived by dividing the total construction cost of a line by the probable number of messages that can reasonably be expected to pass over the line during its life. This item depends directly and entirely on the distance; the length of a line determines it absolutely. It is relatively not as important an element in the total expense as the former. So the total cost of transmitting a message depends on these two different factors, one depending only partially and indirectly on the distance, the other varying directly and exactly with the distance. You recognize the latter factor when you charge more for a 20-mile message than for a 10-mile message. You give recognition to the former factor when you charge less per mile for a long-distance message than you do for one going a shorter distance. The cost of transmitting a message, although it may not be the determining element in the price, is, however, of considerable importance, and must not be overlooked. The notion that a toll message can be handled at a trivial or nominal cost is a dangerous error, and accounts to a great extent for the slashing of toll rates by thoughtless and inexperienced companies. It may seem needless to say that the cost of a message should never equal or exceed the toll, yet I know of numerous instances where this is the case, even where the business is handled at a positive loss.

The next phase of considering distance as affecting the price is, should the air line or the pole line distance between the stations

*A paper read before the Convention of the Wisconsin Independent Telephone Association, June 26, 1902

determine the toll? Inasmuch as the cost of transmitting is only partially dependent on the length of line, and as it costs very little more to transmit a message a roundabout 200 miles than it does the 10 miles straight across, it seems logical to base the rate on the air line rather than on the pole line distance. Telephone companies are common carriers, and, comparing the charging system of railroads, we find that the railroad charges according to the track mileage, no matter how circuitous may be the route. With the railroad both the operating expense and the construction expense of transporting varies directly and entirely with the distance traveled, and hence it is entirely just and proper to fix the charge according to the mileage, and disregard entirely the air line distance. For most commodities and services the cost bears a close relation to price, but in the transportation and telephone business this need not necessarily be the case. In a business that is by its nature a monopoly, like the railroad and the telephone, the price is not closely related to the cost, and the price is usually fixed as high as the business will stand, although it must not be prohibitory. The prime consideration is so to fix the toll that it will bring the maximum net return. No one will dispute that a reduction in the toll means an increase in the number of messages. But as a business proposition five messages a month between two stations at twenty cents each, amounting to \$1.00, are better than ten messages at ten cents apiece, which also amounts to \$1.00; unless such messages increase at least two-fold the reduction in toll has been made at a net loss, notwithstanding the additional business. Each message has a cost, and in addition it should be remembered that the transmitting capacity of a circuit is necessarily limited; when a circuit is worked up to its limit, or nearly so, it means that there is much inconvenience and waiting all along the line, resulting ultimately in loss of business, for if it becomes the rule to require a person to wait 15, 20 or 30 minutes for his party because the line is busy he will figure this waiting as part of the cost to him of telephoning, and in the long run it will not be found to pay to keep the line busy with cheap messages. The promoters of one of the large toll line companies in this State gave to each purchaser of stock a pass entitling the holder to unlimited use of the toll lines. While this pass feature may have made stock selling somewhat easier it worked havoc with the toll receipts. One difficulty was the fact that the passes were nearly always held by parties who would have been the heaviest users of the toll lines, and thus much revenue was cut off, but the main difficulty was that whenever cash customers wanted to use the lines they were always busy and kept busy by the pass or dead-head messages. The company was finally forced to cancel the passes, and will henceforth have a legitimate excuse for existence. When any company thinks it can handle toll messages without cost to itself, and that it can permit the use of its lines a large portion of the time without receiving any return therefor, it is high time for the appointment of a guardian.

I am a firm disbeliever in cheap toll rates. I do not advocate an excessive rate, but the toll should be reasonable, and should be fixed at that point where the total net revenue will be maximum. There seems to be a general tendency to reduce toll rates, and whether this be wise or not I will not presume to state. Suffice it to say that, although it requires no mental effort to reduce a rate, it does take a great deal of tact to increase without friction a rate that experience has proven too low. In some States the law provides for an official who has power to regulate telephone rental and toll rates, but in Wisconsin there is no such official to either help or hamper the business. When such an office is created no doubt the best wire puller will land the job, and your troubles will begin.

The only action the association has taken in regard to the adoption of a standard for fixing toll rates was at a meeting of the Executive Committee, about a year ago, and the standard there adopted was also adopted by the Committee on Tolls in its report to the Milwaukee Convention, but no action was taken by the convention in regard to such report. This rule, which I formulated and introduced at the executive meeting, was as follows: Such combination toll to be two-thirds of the sum of the local toll, and to be divided on the basis of one-half of the sum of the air line and pole line distances between the entering and outgoing stations of the companies transmitting such message, exchanges through which such message passed being taken as equal to three miles of line. This is an awkward attempt to compromise between the air line and pole distance theory, and is ill suited for the purpose intended. I will not enumerate its many defects, but throw it overboard without further comment.

Some companies base their rates, after a fashion, on air-line

distance; others on pole-line distance; most of them on an awkward combination of the two, but with very few exceptions rates are fixed by a haphazard, happy-go-lucky sort of a plan, in which system and uniformity are conspicuous by their absence.

The most feasible and logical plan for regulating rates that has yet been suggested is the zone system, in which the distance is figured solely on the air-line basis, and the pole-line distance is entirely disregarded. Here the charge is based directly and entirely on the service rendered, and the patron pays exactly for what he gets. This is eminently just and fair to the patron, and no matter over how many round-about circuits or through how many exchanges the message must pass, the charge is exactly the same as if the pole line were an air-line route. The great and decisive advantage of this plan is its extreme simplicity, and that should be the paramount consideration. The zone system has been adopted generally by the Michigan Independent telephone companies, and has been found entirely satisfactory in practice. To determine the rates from any given point by this system, with the point as a center, draw a series of circles with the radii increasing regularly. The stations within the first circle will have a ten-cent toll; those between the first and second circles a fifteen-cent toll; those between the second and third a twenty-cent toll, and so on, the toll increasing five cents for each additional circle. The radii of the circles must of course be fixed arbitrarily, and can be so regulated as to make the toll high or low, just as desired. As it is invariably the practice among Independent companies to charge less per mile for the long distances than for short distances, the rate per mile diminishing as the distance increases, a radius increasing arithmetically will give us rates that do not conform to this practice, for then a 50-mile message would be exactly as much as one for 25 miles. Yet a radius increasing in a geometric ratio would make the long distant tolls altogether and relatively too low, for then an 80-mile message would be only twice as much as one for 10 miles, and as the distance becomes greater the disproportion would become still more pronounced. So the problem becomes one of increasing the radius in a manner uniform and regular and yet to make the tolls for the increasing distances reasonable and fair. The plan I here suggest is less arbitrary than any which has been offered in that the radius increases regularly each time. It is as follows: Make the initial radius five miles, then add $5 + 1$ to the first radius to make the second radius. For the third radius add $5 + 2$ to the second radius, and so on, each radius thus being the preceding radius added to a number beginning with 5 and increasing by 1 arithmetically. Stated in another way, the first radius must be five, to get the second add six to the first radius, to get the third add 7 to the second, the fourth will be the third plus 8, and so on. The series of radii will be 5, 11, 18, 26, 35, 45, 56, 68, 81 miles. Twenty-five cents will take a message 26 miles, approximately 1 cent a mile; fifty cents will take a message 81 miles, at the rate of five-eighths of a cent per mile, and an additional five cents will carry the message an additional 14 miles, whereas at the start ten cents will pay for only 5 miles. But in telephony, as in nearly all other lines of business, the rule obtains that a few cents added to a price secures an article or service whose real value increases in far greater ratio than does the price. Consequently there is no violation of any business rule, and particularly not as regards telephony in the diminishing of the rate per mile as the distance increases, for this is a well recognized principle among all telephone companies.

The first criticism that the above rates will receive, which they apparently invite, is that they are too high, and objection will be made especially to the rates in the first and second zones. To such objections the reply is that an air-line mile and a customary mile are practically not the same, by which I mean that in calculating distance we usually mean the distance by wagon road or railroad, which very rarely follow the air line. You will say that according to these rates you would have to charge fifteen cents to Pumpkin Hollow, 6 miles distant, whereas your rate is ten cents, but if you draw your five-mile circle from your center you will be surprised to find your circle will fall a mile beyond your town, because customarily Pumpkin Hollow is considered 6 miles distant, when in fact it is only 4 air line miles distant. Geographically Madison and Waupaca are less than 90 miles apart, yet I traveled some 200 miles to get here, and this section of the State is fairly gridironed with railroads. In short, you will be surprised at the length of these air-line miles, and it may be safely stated that an air-line mile practically exceeds a customary mile by 15 or 20 per cent. So I think that upon careful investigation and comparison you will find a schedule of rates

established on the basis I suggest to be fair and reasonable. By making the initial radius six miles instead of five, twenty-five cents will carry a message 30 miles instead of 26, and fifty cents will carry it 90 miles instead of 81, but remembering the increased length of these air-line miles I give preference to the schedule with a five-mile initial radius.

Concerning night rates, the theory of making the rate for night messages one-half the day rates is, no doubt, that it is better that lines which would otherwise be idle be kept busy with half-priced messages, even if a portion of such night messages would have been sent at day-time and at full rate had there been no night rate. No doubt the much reduced night rate induces some business that otherwise would not come to the telephone company. It is questionable whether it is best to adopt night rates for all stations. To secure the night rate divide the day rate by 2, and if the result is not divisible by 5, add to it until it becomes so. No night rate should be less than ten cents.

A recent innovation by the Bell Company is the minute rate to the non-important stations. This radical departure by the hard-pressed monopoly was made when Glidden held sway and reckless management prevailed, when that company seemed not to care a particle for expense, and had an army of solicitors in the field to keep the company before the people. To unduly emphasize the long-distance feature of the telephone business and to impress the public with the advantage possessed by the Bell Company in this regard, and to discourage further long-distance Independent competition, rather than financial considerations, were the motives that induced the adoption of the minute cut rate. If the operator times the conversation with a clock whose minutes contain 60 seconds, I doubt very seriously whether the minute rate is a paying proposition. If adopted at all it should be confined to messages between large centers.

I have assumed in this discussion of rates that there was no competition with the Bell Company, taking it for granted of course that there was none among the Independents. The competition of the Bell Company is really very limited, as from 60 to 70 per cent. of the Independent toll stations are not reached by Bell lines. In over 100 towns in the State there are exclusive Independent exchanges, and in many others where there are both exchanges the Independent exchange is nearly always much the larger, and even if the Bell lines reach such places the exclusive or larger exchange connection that the Independent toll lines enjoy gives them a great advantage, and practically there is no competition in such cases. Nor do the Bell rates necessarily have to be met in these cases, for the inevitable ten-cent messenger fee of the Bell Company really becomes a part of the cost of the message, and this fee can generally be avoided by the superior exchange facilities of the Independents. As the public as a rule prefer to patronize the Independent company, other things being equal, the competition of the Bell Company in the toll line business is not as formidable as at first appears; but where it must be directly met the rates above stated may occasionally require a special adjustment.

The second part of the subject, the division of tolls, although simpler of solution than the determination of the rate, is of far greater importance. The prevailing practice of division of toll receipts among nearly all companies is to keep what you take in, which, stated without veneer, is a direct application of the porcine rule, take whatever you can lay your hands on, and the other fellow is welcome to the rest. This gross inequity of division or lack of division of toll is a most prolific source of friction among the Independents, and puts a damper on legitimate toll-line construction enterprise.

The plan I would suggest for a just apportionment of the toll is as follows: Combination tolls should be divided among the various companies transmitting the message in accordance with the air-line distance between the receiving and transmitting points of the company transmitting such message, and all exchanges (except originating exchanges) that necessarily handle such message, to be figured as five miles of air line, the originating exchanges to receive 25 per cent. and originating toll stations 15 per cent. of the toll additionally.

As the toll is based on the air-line distance the division should also be, for no premium ought to be placed on circuitous routes. The expression receiving and transmitting "points" has been used instead of stations, as a company's lines do not terminate at stations, but often meet another company's lines midway between stations. Where the pole line belongs to one company the phrase "exchanges that necessarily handle" is used, so that where there are two circuits, a local and a through, the message must be sent over the through circuit if possible, and local exchanges

would be precluded from attempting to switch the message at every flag station exchange in order to obtain increased mileage rating. Neither should a premium be placed on running a second or through circuit into the switchboard of every exchange it happens to pass through. This is something that should be especially discouraged, as it seriously impairs the service. It was at first suggested to give each transmitting exchange three cents per message, but I found numerous cases where the message passed through so many exchanges that the toll was more than equaled by the total of the three-cent exchange fees. As the average toll for a combination message is generally less than a cent a mile, and will often be about three-fifths of a cent a mile, by figuring the exchange as five miles the switching fee will usually be about three cents. Originating exchanges are given 25 per cent. and toll stations 15 per cent. of the toll as exchanges. Toll station agents generally receive a commission, and in addition the work of accounting, collecting and responsibility for toll receipts should be compensated. Occasionally a toll charge is uncollectable, and such loss must be borne entirely by the originating company.

It may be a digression to discuss a plan for the encouraging of the construction of copper circuits, though this is a sufficiently pertinent subject to warrant a brief mention. The great disadvantage the Independents labor under is the lack of long-distance copper trunk lines. This State is particularly poorly provided with such trunk lines, and yet no practical plan has been brought forward to supply the deficiency. To organize a separate long distance company for constructing and operating the lines has been suggested and often discussed, but it certainly does not seem to take hold, and we must fall back on the efforts of the individual companies. To encourage and promote the construction of copper circuits I would suggest that all copper circuits constructed in the future be considered as twice their actual length in the division of tolls for a period of two years. Figuring a mile of ordinary toll line as two miles of line when it becomes copper may seem like doubling the portion of the toll of that company, but such is not the case. To illustrate: Take a message originating with an exchange company, and, going to a station 50 miles distant, passing over the lines of two toll companies, each carrying the message 25 air-line miles over iron circuits. The toll would be forty cents, of which 25 per cent. would go to the exchange company, leaving thirty cents to be divided equally between the two toll line companies, each getting fifteen cents. Now, if one of these companies put up a copper circuit its 25 miles of line would be considered as 50 and the iron-line company's 25 miles would remain as 25. The former company would now receive two-thirds of the thirty cents, or twenty cents, and the latter would only get one-third, or ten cents. By putting up copper the one company increases its share by one-third, and the iron-line company loses one-third. This increase is the tribute which the antiquated, out-of-date, poorly equipped company pays to the modern, up-to-date, properly equipped enterprising and progressive company—the tribute that iron pays to copper. It would not be necessary as a rule to construct new pole lines, as most of the present lines carrying iron wire could easily be adapted to an additional circuit, the latter to be used for long distance, the former for the local toll business. To receive the benefit of this increase the copper line should be used only for the through business and not for the local messages; neither could such line have a telephone at every flag toll station, but only at the more important points. Copper toll line construction in Wisconsin is to-day at a standstill, and something must be done to stimulate it. The lack of such lines is the crying need of the hour, and the man of the hour in the telephone business is he who will devise a plan for securing them.

The committee appointed at Milwaukee to consider toll rates and division will no doubt make a report at this meeting, and my hope is that this paper, in which such an important and intricate subject can be but inadequately treated, will be of some avail to this committee and the members present, and that the combined experience and wisdom of the members of the association can formulate a schedule of combination toll rates so reasonable and fair, and an apportionment of such toll among the companies so equitable and just, that will at once recommend themselves to be adopted by all Independent telephone companies; and thereby the petty grievances, misunderstandings and ill-will only too often existing between companies will be made to disappear, and the association will have achieved a substantial and direct benefit by promoting the spirit of harmony, co-operation and good will among Independents.

CONTEMPORARY CROSS-TALK

IN our last discussion on the rate question we had got to the point of accepting as demonstrated the proposition that in a large telephone system the average distance traversed by a local telephone message will increase—surely, steadily and inevitably increase. Probably there are many telephone men who have not considered how much the problems of a large system differ from those of a small one, who do not appreciate what an important question this distance element in local service is, and who will be inclined to think that in these rambling discussions its importance has been overrated. If there are such, let them consider the question a moment in the light of figures; mainly imaginary figures, naturally, since accurate data on this highly interesting feature of telephone traffic is not available, but none the less forcibly illustrative of the point under discussion for being estimated instead of actually observed.

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In the small place served by a single exchange the average distance traversed by the local telephone message is twice the average length of the subscribers' lines. The average length of the subscribers' lines is usually from a half to three-quarters of a mile, so the average length of line occupied by the local message will be somewhere between a mile and a mile and a half. In a large city the average length of the subscribers' lines will also be in the neighborhood of three-quarters of a mile, perhaps, in certain cities where very tall buildings predominate and the density of subscribers within a short distance of the exchanges is consequently great, rather nearer to half a mile than in the small place, where the subscribers are more scattered. But the large city, with its great area, must be served by a number of exchanges, seldom fewer than three or four, more often ten or twelve, and, in the case of London, as we have already mentioned, by something over forty. All those exchanges are joined together, each to every other, by trunk wires for the conveyance of traffic from one district to another, and it is common knowledge that in all large systems the great majority of telephone messages do go from one district to another, and only a very small minority are local to the exchange in which they originate.

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We see, then, that in the large system the average message necessarily traverses a greater distance than in the small system. We have no means of knowing what that distance is, for any particular city; in some, it must be considerable. It will vary greatly as between different cities owing to a variety of factors, such as the area of the city, the contour of that area, the distribution of the population, the relative situation of the business and social centers, the habits of the people, the telephone development, and so forth. We can only make a guess or an estimate based on what we know of the size and area of certain cities. In the case of London, as we have seen, there are exchanges within the area covered by the local service distant from each other as much as thirty miles. London is an extreme example to-day, but in the future there will undoubtedly be other cities as large as London is now, and as we are building for the future it is well to keep the extreme example in mind. At the present time there are other cities having exchanges certainly fifteen miles apart, and probably in many the maximum distance that a local telephone message may be sent is ten miles or more.

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Even with these figures, while they illustrate the great difference between the *maximum* distance traversed by a telephone message in a small single-exchange system and that available to the local message in a large system, we are unable to do more than guess at the *average* distance traversed by the message in the large system. There are no figures available on this point, and it is necessarily dependent on factors that vary in each place. Let us put it, for the sake of illustration, at three miles. That is only double the average distance traversed by the message in the small single exchange system, and is doubtless well under the mark for most large cities; still it means that the average message in the large city occupies twice as much line plant for its accommodation as the average message in the small place. Consider this in connection with the average amount of traffic and it will readily be seen why the service in a city is so much more costly than in a small place.

In the small place the average daily traffic per line will be five or six calls, say five for the sake of simplicity. In the large city it will be ten or twelve. In the small place let us allow an average distance of a mile and a half per message, which is liberal; in the city let us allow an average distance per message of three miles, which is conservative. In the small place, at five calls daily, the average number of minute-miles (taking three minutes as the average duration of a message) consumed by each subscriber daily will be $5 \times 3 \times 1\frac{1}{2} = 22\frac{1}{2}$, and in the large city the average number of minute-miles supplied daily to each subscriber, at a daily traffic of ten calls, will be $10 \times 3 \times 3 = 90$. The city subscriber consumes therefore four times as much service, measured in minute-miles, as the subscriber in the small place. As stated at Baltimore the other day, the city subscribers' traffic under flat rates steadily and rapidly increases, and the number of minute-miles he calls for is a steadily growing quantity. At Baltimore Mr. Bouton stated that many of his subscribers used the service to the extent of over a hundred calls a day, so the number of minute-miles supplied to one subscriber in a large city will mount up to the hundreds daily and may run into thousands. At flat rates the subscriber who uses hundreds or thousands of minute-miles daily pays the same price as is paid by him who uses only forty or fifty. But what is worse still, and makes the whole scheme of flat rates a losing proposition, unless the rate be fixed so high as practically to prohibit a large development of the system, is that the average use of minute-miles will steadily grow, while the rate remains stationary, so that the cost of furnishing the service must inevitably sooner or later overtake the price at which it is furnished.

This is a fairly clear explanation of the famous old paradox that has always been a reproach to the telephone business among laymen—that the cost of the service per subscriber increases with the number of subscribers. When this proposition is advanced the layman says with a jeer "Then the more subscribers you get the worse off you are!" And the telephone man as a rule has not a very lucid explanation with which to parry that jeer, for as a rule he has been working on a safe margin of profit and until quite recent times the increase of subscribers has been so gradual that there was no risk of the jeer being anything more than a mere jeer—the chance hit of an ignorant critic which sometimes touches the spot. But Mr. Bouton has justified the jeer and proved its truth, for he has discovered that with a fixed flat rate and a rapidly growing system and steadily increasing traffic he was getting "worse off" all the time. So much so that he was driven to state publicly that he must either raise his rates or arrest the development of the system. To such a point must any flat rate city system sooner or later come, since with the growing use of the service the amount of service—the number of minute-miles furnished to each subscriber—will inevitably in time cost the telephone company more to produce than the revenue it receives for furnishing it.

The Listening Key.

THE WINNER OF SECOND PRIZE

MEASURED Service as a Telephone 'Developer,'" by Mr. F. C. Redfield was decided several weeks ago as the winner of the second prize of thirty dollars in the prize contest of THE AMERICAN TELEPHONE JOURNAL. Mr. Redfield's article is printed in this week's issue and will be found on another page. It gives a comparison between flat rate and measured service as in operation in Bell and Independent exchanges, and will repay careful attention.

Mr. Redfield has been in the telephone service since 1887, starting as night operator for the New England Telephone and Telegraph Company. He received promotions and served as lineman, inspector, foreman of construction and exchange manager, and finally taking a responsible place in the general manager's office. He resigned this latter position in the spring of 1900 and for about a year was a traveling salesman for the Ericsson Telephone Company, covering their New England district. In the spring of 1901, he branched out for himself, manufacturing electrical specialties, in which line of work he is still engaged.

Opinion and Comment

THE STUDY OF TRAFFIC

WE commend to the earnest study of all telephone managers the articles by Mr. Abbott, on Telephone Traffic, recently printed in *THE AMERICAN TELEPHONE JOURNAL*. There is no branch of telephone management that will better repay detailed investigation and the compilation of accurate data. It is not sufficiently recognized by telephone managers that the conduct of the traffic is the keynote of the whole telephone business. Between carefully watching the traffic, seeing that it is well cared for and knowing accurately its volume and rate of flow daily and hourly, and letting the traffic and the methods of caring for it take care of themselves, lies all the difference between success and failure.

It will be apparent to every enlightened telephone man that a scientific management of the traffic works in two directions, both of the utmost importance. If the traffic is carefully and continuously watched that means that the operating is being well done, that the exchange is giving its subscribers an accurate, prompt and reliable service. That the first function of a telephone exchange is to give its patrons a service that is accurate, prompt and reliable, every right-thinking telephone man will acknowledge. Yet how many telephone managers keep that axiom continually in mind? How many telephone exchanges does not every one of us know where it is perfectly obvious that the management is thinking of anything else but of what should be its principal aim, the production of a thoroughly efficient service—a thoroughly efficient conduct of the traffic?

It is the more remarkable that this should be so because the sole object of a telephone exchange is to furnish telephone service, and it should naturally be the first and central thought of every telephone manager to make his service as efficient as it can be made. Unfortunately the general tendency of telephone managers is to devote too much attention to other matters and to let the traffic, the operating of the service, the actual article they are selling to the public, largely take care of itself. With a different policy, a policy in which the attainment of the highest efficiency in the conduct of the traffic should be the battle cry, almost everything else might be left to take care of itself. Or, rather, such a policy would automatically compel everything else to be properly taken care of, since a thoroughly efficient service cannot be given without a thoroughly efficient force and plant. The first telephone system to be run on these lines will be the first really popular telephone system in the world.

The manager who studies his traffic, first, last and all the time, will not only be rewarded by producing an efficient and popular service, but he will, as Mr. Abbott points out, gain a knowledge of his plant and of the best methods of operating it that will immensely aid him in the general conduct of the business. Telephone traffic has many peculiarities, which is one great reason why it demands such close and persistent study. It is the commodity in which the telephone exchange deals, yet it is produced or at least its production is started outside and not within. The time and rate of production are wholly beyond the control of the exchange, and wholly under the control of the public.

In the long run, every public purveyor must supply the public in the manner the public demands. But the telephone man-

ager is at a peculiar disadvantage. The manufacturer can run his plant half-time, full-time or over-time, can store surplus product or can even at times make the public wait. The railway or steamship manager makes a time table to which the public must needs conform, though he need not. The telegraph manager takes your written message and leaves you to guess what he does with it. But the telephone manager must be always ready to work full time and at full speed, and may be called on to carry an overload at any moment. He has no storage and cannot afford to get a reputation for delay. He may be called on to make a hundred calls an hour or ten thousand in ten minutes, and every call is an individual operation, to be handled as such. There are others, but these are a few of the reasons why a telephone manager should make the study of telephone traffic his chief aim in life, the subject of all his waking thoughts.

THE CONDUIT SITUATION

INDICATIONS are piling up to show that the conduit manufacturers are getting closer and closer together. Whatever their present status, it is practically evident that most of the large concerns have at least a working understanding, if, indeed, there is not actually in existence a controlling trust. This condition in the industry is a serious menace to the telephone companies. Underground work is becoming more and more important, and if the material on which operators depend is to be controlled by one man or set of men, it behooves the consumer to get in touch with the true situation and to take such measures as lie within his means to protect himself.

THE AMERICAN TELEPHONE JOURNAL pointed out some time ago that a combination had been effected by some of the larger concerns. This brought out a vigorous denial by one of the oldest companies. The denial, however, had a good-sized string to it. It was sent under the seal of confidence—that is, the editor of *THE AMERICAN TELEPHONE JOURNAL* was assured that this particular concern was not in the trust, but he was told also that under no circumstances must he use this information under the authority of the concern sending it. The object of this was very evident. Negotiations were on, and the company, while desiring to get the full benefit of the denial if it might be, had no stomach for having its letter made public and bringing upon itself the hostility of the persons who were holding out inducements to “come in.”

In view of this very apparent effort to carry water on both shoulders, *THE AMERICAN TELEPHONE JOURNAL* took no cognizance whatever of the denial. That the conditions were pretty accurately sized up by this paper seems to be shown by developments of the past few days, for it is now stated on very good authority that the concern which put in the vehement denial and professed to have been very much injured has been bought out bag and baggage by the controlling head of the conduit combination. The next move will probably be a further increase in the price of conduits to make up for the sum required to bring this new member into the fold.

The operating companies are, however, not entirely powerless, as the matters stand to-day. There are still one or two concerns who are independent of the trust, and who are prepared to book orders at prices below those fixed by the combination.

TELEPHONE OPERATORS AND OPERATING ROOM MANAGEMENT

By C. E. McCLUER

HERE is no department of a telephone exchange system in which judicious liberality brings a better interest upon the investment than in the operating room. Twenty years of telephonic experience has abundantly confirmed the opinion adopted in the early days of the business, that the character of the exchange service and the success of the exchange depend largely upon the character and ability of the central office operators, and upon the intelligent and faithful performance of their absorbing and exacting duties. More largely in fact than upon any other department. For no matter how excellent may be the character of the plant, inside and outside; no matter how well constructed the lines, or how ingenious and well installed the central office appliances, unless the board is manipulated by competent, intelligent and faithful operators, the service will never reach the topmost pitch of perfection.

The youths originally utilized to perform the duties of exchange operators were early discovered to lack the essential qualifications of patience, courteousness and faithfulness, and a long stride in the direction of perfecting and popularizing the telephone service was taken when they were relegated to more masculine employment, and the better qualified young women were placed at the telephone switchboards. The introduction of female operators wrought a revolution in the relations between the patrons and the telephone companies. The boys, by their impatience of control, their quick tempers and their hasty tongues, which so often wagged offensively at a patron who either justly or unjustly took them to task for actual or supposed derelictions of duty, kept the officers of the companies and their customers continually at variance—the subscribers constantly complaining of the incivilities or other shortcomings of the operators, and the managers, aware that the operators were often “more sinned against than sinning,” endeavoring to defend and uphold them, sadly conscious of the fact that competent operators to take the places of those dismissed could not be found in a day.

Hence with the advent of the female telephone operator came a relief to both exchange managers and patrons, the one being practically freed from the vexations and oftentimes unreasonable complaints of his patrons, and the other relieved from the exhibitions of churlishness and uncouthness on the part of the operators.

The feminine disposition is especially adapted to endure the restraints and vexations inseparable from the telephone service. Women possess to an eminent degree the commendable traits of domesticity, patience, courtesy and contentment, and the dulcet tones of the feminine voice seems to exercise a soothing and calming influence upon the masculine mind, subduing irritation and suggesting gentleness of speech and demeanor; thereby avoiding unnecessary friction, and largely conducing to mutual satisfaction. We regretfully admit that all women are not angelic in disposition, any more than in face and figure, but as a rule they possess many more angelic attributes than do the vast majority of the sterner sex; and for that reason they are more acceptable to telephone patrons as operators. I have, however, known female operators who were not justly amenable to the charge of amiability, and who unfortunately possessed the same proclivity for getting into trouble with their subscribers that characterized the boy operators; but they are the exception, not the rule. With the boys, it was the other way about. The telephone manager should therefore scan closely the character and disposition of his appointees, and should be exceedingly careful to exclude all but the most amiable and conscientious, who possess also the other necessary qualifications of aptitude and intelligence.

Aptitude or quickness of perception, and intelligence are natural attributes, but are capable of almost indefinite expansion by education and experience; while amiability and conscientiousness are acquired through precept and example during the years of childhood. But all of these attributes, whether natural or acquired, should be, and usually are, characteristic of a good telephone operator.

When a young woman is found to possess the above qualifications combined with the requisite physical stamina she should be cherished by her employers as valuable beyond expression, and

every inducement should be held out to her to remain in the business. Not only should her hours of service be restricted, because of the intense mental and physical strain to which she is subjected while wearing the headgear, but her compensation should be exceedingly liberal. Certainly she should be paid fully as much as a man, whose duties she performs more creditably and more satisfactorily than he can possibly do.

Besides, liberal salaries will attract the educated and intelligent girl, particularly if the hours of service are not too extended, and will hold her, too. Even an offer of marriage, unless particularly enticing, will often be rejected in favor of a life of comparative ease and independence, which all girls covet, but few secure. Hence I contend that liberal compensation, and the absence of onerous restrictions or hours of labor, will enable the telephone manager to command the services of “the brightest and best,” and if in addition their surroundings are such as to promote cheerfulness and contentment, the prime factors necessary to the provision of a successful and satisfactory telephone service will have been adopted. Money spent in order to attain this object is well and wisely disbursed.

Installing a new and inexperienced operator at a telephone switchboard is a calamity to the service, and should be done only when unavoidable. A pupil should not be allowed to attempt to give service until she has spent weeks of practice on a dummy board, and even then, after she has mastered the switchboard routine, she should not be allowed to give actual service without the constant supervision of a thoroughly competent operator for several weeks longer, or at least until she has proved herself capable of handling calls rapidly and without frequent errors.

Telephone subscribers are usually impatient and exacting, and even an occasional error will elicit serious complaints against the service, and retard the growth and injure the prospects of the exchange. Therefore an approximately faultless operating room service is a desideratum towards which all exchange managers should bend their energies, and in no single particular can they accomplish more to that end than by enhancing in every way possible the rapidity, reliability and accuracy of the operators.

Complaints against operators, especially those having a well-established reputation for skill, reliability and truthfulness, should be investigated carefully and dispassionately, no matter how bitter the complaint or how influential the complainant. The operators should be assured that justice will be done them under all circumstances; that the adequate punishment will be meted out to them if found guilty of a serious infraction of the rules, or that they will be honorably exonerated if proved innocent; while in cases of doubt they will be under strict surveillance, and the doubt will be carried to the next complaint against them. This knowledge will usually incite them to the exercise of care as well as celerity in the performance of their duties and induce them in every way possible to avoid giving further cause for complaint. That is, if they appreciate and value their positions. If any are habitually careless and indifferent they should be allowed to seek other employment.

The manager should insist upon a *correct* in preference to a *rapid* service, and in order to accomplish that result should be careful not to overload his operators. Rather increase the number of boards and operators, than effect a poor economy by overloading them. A subscriber will condone a reasonably slow service much more readily than he will an incorrect or unreliable service. He will be better satisfied if his operator is slow but sure, than if she is quick and inaccurate. A few seconds delay he will pardon if he gets the party he wants, but no matter how rapidly he may be served, he will growl angrily if he finds the operator has called up and put him on number 232 when he asked for 322, and number 322 will slam his receiver on the hook in a rage when he finds he has been called “by mistake,” and both subscribers will mentally anathematize the operator and condemn the service. While such mistakes are often the fault of the telephone user, by reason of his defective articulation or faulty memory, he never forgives the operator for such an error.

Premature or tardy disconnections are not so common on the modern central energy and lamp supervisory boards as they were on the old style magneto clearing-out drop and trunking system

boards, though they are still apt to occur on the sections of careless or indifferent operators; but no means have as yet been discovered to avoid the errors and misunderstandings between subscribers and operators, unless indeed of ingenious automatic systems that eliminate the operator as well as the errors can be so accounted. Only the exercise of good sense and care on the part of both operator and subscriber can prevent all mistakes, though much can be accomplished in that direction by the careful, painstaking operator who would rather be right than rapid.

As a further incentive to the attainment of first class switchboard work, I would suggest that a system of "rewards of merit," based upon the weekly or monthly performance of each operator, be instituted. A daily record of the work of each operator should be kept, indicating time reported for duty, time relieved from duty, hours at the board, hours of relief, and the number and nature of complaints from subscribers, from the chief operator or her assistants, or from other operators; upon this record could be based a weekly or monthly rating of general efficiency and deportment; those rating highest being put on a roll of honor to be posted on the bulletin board so that a spirit of emulation would be engendered and each operator would be nerved to do her best to merit such distinction. A few of those standing highest on this roll of honor might be further rewarded and encouraged by a money prize, graded, say from one to five dollars, as an additional incentive to smart service and deportment. Such a scheme as this would undoubtedly increase largely the *esprit de corps* of the switchboard force, and if impartially and justly administered would go far toward the elimination of many of the faults and errors of operators that stand in the way of perfect service.

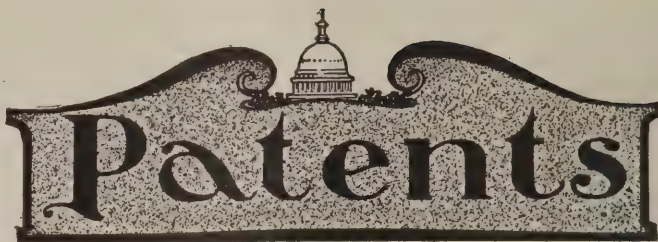
An absolutely perfect telephone service is however an utter impossibility as long as it is dependent upon "things animate and inanimate." The "personal equation" and mental and moral mutations of the "animate" operators, and the natural perversity of the "inanimate" paraphernalia comprising the exchange plant. But while absolute perfection is unattainable, a high state of excellence, approaching perfection, is within reach of the wise and enterprising manager, and should be diligently aimed at.

With a fairly good line plant and the best apparatus now turned out by experienced manufacturers, careful, intelligent and persistent effort to secure the highest degree of excellence in the labors of the best and most intelligent female operators will indubitably result in a service so nearly perfect that subscribers' complaints will be reduced to a happy minimum, and the few that do reach the ears of the manager will be found to emanate from the "chronic kickers" whom absolute perfection, or even "heavenly bliss" itself, would not satisfy.

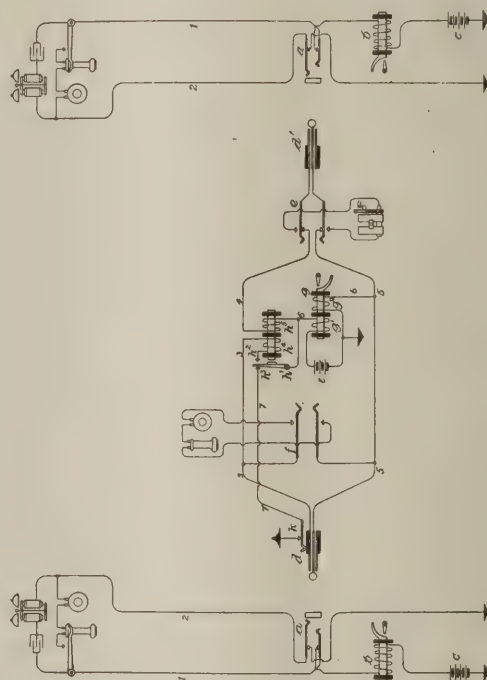
THE TELEPHONE AND HOLIDAYS

THE steady increase in the number of business holidays in the year, the fact that Saturday is a half holiday in all seasons, and in Summer is practically *dies non* from a business point of view, and the disposition to make a Friday holiday extend over until the succeeding Monday, indicates that it is easier than it was a generation ago for the business men to "take a day off" without disadvantage, says the *New York Times*. Men are no less diligent in business than formerly. Indeed, modern conditions make all gainful occupations more strenuous than they used to be, and in the larger opportunities for relaxation which are now offered the agencies for facilitating business are enabling the merchant and professional man to accomplish more work in less time than ever before.

No doubt this grows out of improvements in intercommunication. The telegraph and the telephone, supplemented by fast and frequently distributed mails, release the man of business from much of the routine and drudgery of former years and permit him to dispatch in a brief time what was once a monotonous and voluminous correspondence, with necessarily tedious intervals between asking for information and getting it, or between the necessity for communication and the ability to communicate. This permits a greater latitude in the matter of holidays, and may even demand more relaxation than was necessary in the days when the merchant bought his goods one box to the invoice and received his mail weekly, or even under the conditions which obtained before the telephone made the whole community members of a great commercial exchange with practically uninterrupted communication during business hours. What this accomplishes and what it saves in the way of time and effort can be more easily understood than described. The vacation habit makes for good, and it has not been observed that it is destructive of business success in those who acquire it.



Charles E. Scribner, of Chicago, patents (No. 12,007, July 1, 1902, re-issue of No. 638,426, December 5, 1899) a supervisory signal designed to indicate only when the called party takes his telephone down and thereafter only when both subscribers shall have hung up their receivers. The drawing shows a common battery system with jacks *a*, line-signals *b* and battery *c*. The supervisory signal *g* indicates when inert and conceals its target when energized; it has two windings *g*¹ *g*² connected in series with a battery *i* in a bridge 6 which is connected across the cord conductors 5, 4, being joined to 4 through winding *h*⁵ of relay *h*. The other winding *h*⁴ of the relay is connected to conductor 3 of the cord circuit. The armature of *h* forms a switch contact between points *h*³ and *h*². Normally in contact with *h*³ it establishes a local circuit by conductor 7 and plug-seat switch *k* controlled by the answering plug *d*, containing battery *i* and one winding of *g*. Switch *k* is shown connected to ground, the effect being the same as if it were joined to 6 at the point where



6 is shown to be grounded. This local circuit keeps energized and the target hidden. When answering plug *d* is lifted, switch *k* is opened and the local circuit broken, thus allowing the signal of *g* to be displayed. When the called station responds, closing the circuit between wires 1 and 2, connected to plug *d*¹, a circuit is established from *i* through 6 and one winding of *g*, through *h*⁵ and 4, line 2, station circuit line 1 and back to *i* by wires 5 and 6 and second winding of *g*; *g* is then excited and the signal concealed, indicating that the called party has answered. Relay *h* being also excited, attracts *h*¹ to *h*² uniting conductors 3 and 4, which join the sleeves of answering plug *d* and calling plug *d*¹. Current now flows from bridge 6 to both connected lines and both relay *h* and signal *g* will remain excited as long as either telephone is off its hook. When both stations hang up, current is interrupted and both *h* and *g* become inert; the target of *g* is displayed, indicating now a disconnection signal. When plug *d* is returned to its seat closing *k* the local circuit is again completed, *g* is energized and the target restored to its normal position of concealment.

GAS-PIPE TELEPHONY

"WIRELESS" Telephony" is what the Philadelphia *North American* calls it in the following dramatic article on some experiments in Paris to which we have referred once or twice before:

Paris has the first successful wireless telephone in actual use. While other inventors are striving to discover such a system, M. Ducretet, a noted scientist of Paris, has been evolving a method whereby persons miles distant can speak to each other without tangible connection.

He has at last finished his apparatus and put it into operation. The first tests of his wireless telephone were made between his home and his office, a distance of only a few rods. Later he extended the connections with equal success, until he now has established stations at various points throughout Paris, some being a mile and a half distant.

By Ducretet's scheme the earth acts as conductor. The operator speaks into a receiver, the sound is carried by copper wires to the ground, then the earth transmits it to the point of reception, where another copper wire collects the message and makes it audible.

Ducretet's theory is comprehended in the use of the electric currents of the earth instead of the ether currents with which wireless telegraph and telephone experiments have usually been made. Experiments show that distance only increases the clearness and distinctness of the tone of the speaker heard over the wires, or, more correctly speaking, through the earth. Ducretet's plan has this advantage over the telephone in use to-day, that there is no burring, clicking or other disagreeable sounds which offend the ear in the wire system.

The French scientist has constructed an apparatus capable of producing a large number of electrical vibrations to the minute, and this machine plays a very important part in the system which he has discovered. So far, the only other apparatus used, aside from the patented battery, are the ordinary receiving and transmitting instruments.

Attached to the transmitting apparatus is a wire which is grounded, and the receiving station consists merely of a similar grounded wire connected with the receiving instrument.

M. Ducretet has been working on his invention for eight years, but he has been doing it so quietly no one heard of his hopes and ambitions until he revealed his plans to a friend about a month ago and asked permission to place a receiver in his office. Consent was given, and although the friend thought the scientist an idealist doomed to continual disappointment, and although he had no faith in the plan, he promised to be on hand at a stated date to receive a message which Ducretet hoped to send successfully.

Upon the day appointed the call bell tinkled, the friend took down the receiver and Ducretet's voice said:

"Good morning, monsieur. Can you hear me distinctly?"

The friend was so startled he dropped the receiver and jumped back from the instrument as though fearful that it would do him bodily injury. Ducretet waited patiently at the other end, waiting for his disconnected wire to bring a reply.

Silence, deep as the tomb—still Ducretet waited. Minute after minute passed, and there was no response. The inventor was sunk in the deepest gloom, believing that the eight long years of untiring labor had proved fruitless.

While gathering courage to set to work once more and seek for the flaw in what had seemed a perfect scheme, his friend, hatless and out of breath, dashed into the office, grabbed Ducretet by the hand and exclaimed excitedly:

"My friend, you are the greatest man of the century! Wireless telephony is possible!"

Together the two men put the plan to test after test, all of which proved eminently successful. Finally the news, spread, Ducretet was visited by investigators from all over the country, and received congratulatory letters from those in foreign lands. Up to date the wireless telephony has worked without a hitch.

One and one-half miles is as yet the longest connection, but Ducretet is now preparing to establish an eight-mile circuit. That accomplished the scientist's fame is secured, for a system that will work successfully eight miles can readily be extended as far as required.

All this is no doubt highly interesting to the newspaper man and to the newspaper reader, but the telephone man knows that telephoning by conduction through the earth has been done before. An iron gas or water pipe will give good talking for some dis-

tance under certain conditions. The apparatus "capable of producing a large number of electrical vibrations to the minute" has nothing to do with the case, and the rest of the article is pure nonsense and probably mainly fiction. It was a pity that Mr. Ducretet did not choose for an assistant some one of a sufficiently practical turn of mind not to be thrown into a trance on hearing a telephone talk. As to prophecies, it by no means follows that should Mr. Ducretet succeed in talking eight miles by conduction through the earth, or along a gas-pipe, that he will have established a system that can readily be extended as far as required. In spite of the enthusiasm of the *North American* writer, it hardly looks as if Paris had yet solved the problem of wireless telephony.

TREATMENT BY TELEPHONE

WE heard a doctor complain recently that one of his patients, in order presumably to save his time, sometimes called him up on the telephone when she wanted him to give advice about the baby. The good dame would sit at the other end of the wire, pencil in hand, and ask the unfortunate doctor to dictate his instructions while she took them down. This continued until one day she asked him to dictate his prescription. At this he rebelled. He was willing to take the baby's temperature and pulse by telephone, and even to inspect the character of the dejections; he was even willing to tell all he knew about babies in general and about that baby in particular; he did not even object for awhile to give the lady the full benefit of a professional call and charge it as an office visit, but his conscience smote him when it came to dictating a Latin prescription by telephone and having the thrifty minded housewife sign his name to it before her own initials.

Some physician should write a chapter on the medical ethics of the telephone. We would do it ourselves if we felt capable. There are two sides to the question. The patient sometimes gets the better of the doctor and saves a fee, but the doctor sometimes gets the better of the patient and saves himself a lot of trouble. It is obvious in either case the patient should pay for it. But the question arises, What should he pay? Is it an office visit or a house visit? The advice is given in the office, but it is received in the house. This is somewhat of a metaphysical quandary. Should a doctor charge an office fee for giving advice that goes straight to the patient's bedside? On the other hand, should a patient be obliged to pay a house fee for advice which a doctor gives sitting comfortably in his office? The problem is full of difficulties. Perhaps it would be best to call it half-and-half, and charge accordingly.—*Philadelphia Medical Journal*.

CURIOUS RESULTS OF TELEPHONING FOR A DOCTOR

CALLING the doctor by telephone has its disadvantages in spite of the popularity of the method, says the *New York Sun*. Its new danger was made plain the other day by a woman who wanted her husband's physician to call on him at a certain hour. She called for the doctor, giving the number that stood opposite his name in the telephone book. She observed every requirement of telephone etiquette to the extent of asking if she was speaking to the right house and then asking for the doctor to come to the telephone.

The answer came back that the doctor was not at home, but was expected at a certain hour and the message was taken for him to call at a certain hour. In every case the name of the doctor was several times mentioned. At the appointed hour an entirely strange physician arrived. His name did not in the least resemble that which had several times been spoken over the telephone, and there was no obvious ground for confusion. But the visitor insisted that he had been called by telephone to visit this house at a certain time.

Whether some operator was in league to increase this doctor's practice of diverting patients to his office, whomever they may call, or whether the whole incident was the result of a mistake the persons interested were never able to discover. The most noticeable fact in the affair was the entire lack of similarity between the name that was called for and frequently mentioned and that of the doctor who actually arrived.



Legal

OMAHA, NEB.—In the case of Clark against the South Omaha Independent Telephone Company Judge Dickinson has granted a temporary injunction. The order of the court prevents the defendant concern from building and maintaining a telephone line in South Omaha under a franchise granted to an electrical manufacturing company. The judge held that the franchise did not include the operation of a telephone system. The franchise was transferred from the electrical company to Frank Crawford and then to the defendant.

Financial

FRANKFORT, IND.—The County Board of Equalization has fixed the assessment of the telephone companies operating in the county, as follows: Peoples' Co-operative Telephone Company, \$2,625; Rossville Home Telephone Company, \$1,800. The personal property of the Bell Telephone Company was assessed at \$50 and that of the Central Energy Company at the same figure. The plants of these companies, in common with all others that operate lines in more than one county, are assessed by the State Board of Equalization.

WHITELAND, IND.—The Whiteland Telephone Company, of Whiteland, has increased its capital stock to \$10,000.

BOSTON, MASS.—The statement of the Mexican Telegraph and Telephone Company for the quarter ended June 30 (partly estimated) is as follows: Receipts, \$104,500; operating expenses, \$24,500; net earnings, \$80,000; other income, \$13,496; total net, \$93,496; proportion to the Mexican Government, \$5,000; dividends, \$47,815; surplus, \$40,681; total surplus, \$1,121,676.

DETROIT, MICH.—The Detroit Co-operative Telephone Company has filed a \$25,000 bond which is supposed to guarantee to the city the expense of making any repairs to streets which may be necessary through the tearing up of pavements by the telephone people. The bond is signed by C. M. Burton as president of the company and by J. Ward Howland as treasurer.

KIBBIE, MICH.—The capital stock of the Kibbie Telephone Company has been increased from \$25,000 to \$50,000.

NEW SHARON, ME.—The capital stock of the New Sharon & Norridgewock Telephone Company has been increased from \$2,000 to \$10,000.

SOUTH GLENS FALLS, N. Y.—Special franchise taxes in Moreau as levied by the State Tax Commissioners have been received by the town clerk as follows: Hudson River Telephone Company, \$2,500; American Telephone and Telegraph Company, \$900, and New Union Telephone Company, \$150.

BARTLETT, OHIO.—The capital stock of the People's Telephone Company, of Bartlett, has been increased from \$2,000 to \$5,000.

BALLINGER, TEX.—The capital stock of the Central Texas Telephone Company has been increased from \$50,000 to \$75,000.

New Companies

MITCHELLVILLE, IA.—The Mitchellville Telephone Company has filed articles of incorporation with the county recorder. The capital stock is \$10,000 and the incorporators are S. B. Uhl, B. R. Patterson, S. J. Oldfield and D. K. Pearson. The company's officers are S. B. Uhl, president; B. R. Patterson, secretary, and S. J. Oldfield, treasurer.

COLFAX, IND.—Articles of incorporation have been filed by the People's Co-operative Telephone Company of Colfax; capital stock, \$600. Among the incorporators are J. A. Morison, E. L. Darby, John Coyner, B. Bailey and P. Dunbar.

NICHOLASVILLE, KY.—The Jasmine County Home Telephone Company, of Nicholasville, has been incorporated, with a capital stock of \$50,000. It will construct and operate telephone and telegraph lines in various parts of Kentucky.

PARIS, KY.—The Bourbon County Home Telephone Company has been organized to construct and operate telephone and telegraph lines in Paris and Bourbon County. The capital stock is \$75,000, and the incorporators are from Lexington.

BUCKNER, MO.—The Jackson County Telephone Company, of Buckner, has been incorporated, with a capital stock of \$5,000, by U. D. Ravenscroft, Ed. C. Roth, J. G. Burnley, G. M. Chiles, A. B. Frazier and others.

TARKIO, MO.—A farmers' mutual telephone company has been organized at Tarkio.

ALBION, N. Y.—The Rural District Telephone Company, Albion, has been incorporated, with a capital of \$25,000. Directors: William E. Peck, Frank Grantier, Frederick C. Lincoln, Buffalo.

NEW YORK, N. Y.—The De Veau Telephone Manufacturing Company, New York, has been incorporated; capital, \$50,000. Directors: A. S. De Veau, William Hoffman, New York; Charles Auth, Brooklyn.

KENTON, OHIO.—The Kenton Construction Company has been organized for the purpose of constructing telephone plants. The capital stock of the company is placed at \$10,000. Joseph Timmons, John W. Fulton, J. B. Seymour, James Bastable and F. D. Bain are interested.

PITTSBURG, PA.—The Consolidated Improvement Company, of Pittsburgh, has been organized to acquire telephone, telegraph and railway lines; capital stock, \$1,000,000. Incorporators: C. W. Ruth, Alliance, Ohio; W. Clark, Pittsburg, Pa.; W. S. Hille, Wilmington, Del.

JACKSON, TENN.—A telephone company has been organized to operate a system here, with a capital stock of \$125,000. The men behind the company are Joseph D. Lloyd, Robert T. Pettebone, F. C. Johnson, A. D. Hay and others.

AUSTIN, TEX.—The Ellis County Independent Telephone Company was chartered here recently, with a capital stock of \$100,000.

MONNINGTON, W. VA.—The Augusta Telephone Company, of Monnington, W. Va., has been incorporated, to operate a telephone line. Capital stock, \$100,000, of which amount \$600 has been subscribed and \$60 has been paid. Incorporators: F. R. Stewart, J. N. Devare, R. W. Bryant, E. C. Martin, Caleb Burton and C. E. Jolliffe, all of Monnington, W. Va.

SUSSEX, WIS.—Articles of incorporation have been filed for the Lisbon Telephone Company, of Sussex, Waukesha County, with a capital stock of \$720. Incorporators: James R. Watson, Alexander Will, C. W. Weeks, W. D. McGill and G. C. Butler. Telephone lines will be constructed and operated in and around Lisbon.

NASHVILLE, TENN.—Articles of incorporation have been filed by the Warren County Telephone Company, of Warren County, capitalized at \$125. Incorporators: W. S. Ross, J. L. Ross, J. C. Biles, John B. Biles and George Hayes. It is the intention of this company to build a telephone line from McMinnville to Increase, and to make such other extensions as are desired from time to time.

Rates

CHICAGO, ILL.—Telephone bills for large users of the wires will be increased in the new ordinance to be submitted to the City Council by the special committee. The rates to the ordinary users, who form the bulk of the telephone company's list of patrons, will be largely decreased. Toll service within the city limits will be entirely abolished, and the company's territorial bounds will be made coextensive with the city's. Payment will be by the message and not by an arbitrary rate.

Elections

MADRID, IA.—At a meeting of the People's Township Telephone Company these officers were elected: President, T. R. Dreaser; vice-president, Joe Kenison; secretary and general manager, F. A. Anderson.

DETROIT, MICH.—C. M. Burton has been elected president, and J. Ward Howland, treasurer, of the Co-operative Telephone Company. F. F. Ingram and Hamilton Carhart have resigned as directors.

THOMSON, PA.—A telephone meeting was held recently at Thomson, with about 200 present. R. F. Howard was elected chairman. The following directors were elected: G. S. Tingley, E. W. Burns, Frank Benson, W. E. Perham, Wm. E. Kestler. A meeting was called for Herrick, and the board was organized as follows: E. W. Burns, first vice-president; Frank Benson, treasurer; Wm. E. Perham, secretary.

TOWANDA, PA.—The following directors were chosen at a recent meeting of the Bradford County Telephone Company. C. L. Tracey, H. C. Porter, William Maxwell, W. M. Fell, G. T. Ingham, S. C. Thayer, E. B. McKee, M. E. Horton and W. G. Tracey. The company now has 187 instruments in use on its line, 136 being on the Towanda exchange and others on the exchanges in other parts of the county.

THE WEEK'S MESSAGES *Continued.*

Franchises

CARLINVILLE, ILL.—The Carlville Telephone Company has been granted permission to put in poles and string wires along the highways in Jersey County.

CHICAGO, ILL.—The United Telephone, Telegraph and Electric Company, which has a franchise to operate in Hyde Park, has applied for the privilege of operating in the entire city of Chicago.

FREMONT, NEB.—The City Council at a special meeting granted J. L. Laird, B. W. Reynolds and others a franchise to institute and operate an Independent telephone system in this city. The franchise is a little different from that granted to another Independent company several months ago, but under which the company did not commence business. The rates for direct connection must not exceed \$2 for business houses or \$1 for residences. Party lines must be 20 per cent less. The promoters must signify their acceptance within thirty days and commence work within three months. No poles are to be erected in the business part of town unless a connection can be made in no other way.

EGAN, S. D.—At a meeting of the Council a franchise for three years was granted N. H. Hoopin for a local telephone line. If the experiment proves a failure he will relinquish the franchise.

GLENWOOD, WIS.—A telephone franchise has been granted to Thomas Brockley, of La Farge, by the Glenwood Council. Mr. Brockley proposes to establish a telephone system to Downing, Boyceville, Emerald, Ceylon, New Richmond and other neighboring points.

Combinations

MEXICO, MO.—The Mexico telephone plant has been sold to R. V. Montague and other Kansas City men. The lines are to be extended in this section of Missouri, and about \$10,000 spent in improvements. Mr. Montague is president of the R. V. Montague Bond Investment Company, of Kansas City.

BELMONT, N. Y.—The Belmont Telephone Company's plant has been sold by Dr. Paul, Mr. Curtis and other interested parties to George DeGolia of Salamanca. Mr. DeGolia becomes superintendent and manager of the system, which is connected with the Inter-Ocean long distance lines. The new directors are G. E. DeGolia, W. P. Clark, W. J. Hardy, Eldyn Reynolds, H. A. Barney, J. H. Anderson and W. J. Richardson. A majority of these gentlemen are financially interested in the Citizens' Telephone Company, of this place, and the purchase of the Belmont Company's plant will eventually mean an absorption of it by the Citizens' Company.

NORWALK, OHIO.—The Local Telephone Company, of Norwalk, has purchased the Wakeman Mutual Telephone Company, of Wakeman. A new exchange will be put in at Wakeman by the Local Telephone Company, which will give Wakeman connection with New London, Berlin Heights, and all parts of Huron County, portions of six other counties, and also long distance connection with the United States Telephone Company. The local Telephone Company proposes to install a farmers' line to run for three miles in the country around Wakeman.

WINCHESTER, VA.—The Winchester Telephone Company's plant, covering Frederick and Clarke counties, in Virginia, and Berkley, Jefferson and Hampshire counties, in West Virginia, has been sold to the United Telephone Company, of Philadelphia. The local corporation was absorbed recently by a Hanover, Pa., syndicate, and sold by them to the United Company. Extensive improvements, placing the local system in connection with long distance telephones, will be made at once.

Construction

BORDEN, CAL.—A telephone system is being established in Tombstone, and will be made a part of the Independent Gila Valley system. The line will be extended to Bisbee at once.

OGDEN, IA.—The Ogden Telephone Company is building a line from Ogden to Berkley, which will accommodate about twenty-four farmers' homes with telephones.

CARROLLTON, KY.—R. M. Barker, general manager of the Carrollton Telephone exchange, went to Owenton with sixty-five men to build a line to meet the Home people of Louisville.

HORSE CAVE, KY.—The Gainesboro Telephone Company is putting in a new long distance line, connecting Burkesville and Glasgow, by way of Tompkinsville. The poles have all been distributed and the wires are up about half the way. The line will connect at Glasgow with the Cumberland. There is a strong probability that an exchange will be put in at Burkesville.

LOUISVILLE, KY.—The Lawrenceburg Home Telephone Company, a branch of the Home Telephone Company, of Louisville, has a large force at work repairing its lines throughout the county. A new cable has been placed, thus dispensing with a large number of wires.

LEVERETT, MASS.—The Valley Telephone Company is extending its line from North Leverett to Leverett Center.

LANSING, MICH.—The Citizens' Telephone Company has completed the laying of 18,000 feet of cable, and Superintendent F. A. Hughes has or-

dered 6,000 feet more of the same material. When all the telephones are installed the exchange will have over 1,500 connections.

STILLWATER, MINN.—A rural telephone line is being established between this city and Withrow, and if plans now under way are carried out there will soon be telephone lines from Stillwater to all parts of the county.

SEDALIA, MO.—The Benton County Telephone Company, a new competitor of the Russell and Bell companies, is stringing wires, and will soon have the line in operation into Sedalia. There are to be exchanges at Warsaw, Lincoln and Cole Camp, with a toll station here. Many private lines run to farms in Benton and Pettis counties.

CARRINGTON, N. D.—Arrangements have been made by Attorney Leslie to begin the building of a telephone line from Jamestown to Carrington to connect with his Carrington-Fessenden-Harvey line.

NEW LISBON, N. J.—The Farmers' Telephone Company, to extend from New Lisbon, in this county, to New Egypt, in Ocean County, expects to complete its line by Aug. 1. The organization as effected at New Lisbon has the following officers: President, H. M. Black, of New York city; secretary, M. Warner Hargrove, of Brown's Mills; treasurer, Wm. H. Reeves, of New Lisbon.

SUSSEX, N. J.—The recently incorporated Farmers' Telephone Company is extending its line into Orange County, N. Y. It is reported that a right of way has been secured through to Middletown, touching all intermediate towns and villages.

ROME, N. Y.—The people of Vernon Center, Knoxboro and Augusta Center have for some time been agitating the proposition of constructing an extension of the Rome Home Telephone line from Vernon to connect with these three villages. The matter has now taken tangible form, and it is expected that the work will be rapidly pushed, as nothing remains to be secured except the franchises from the different town boards, and these have been assured. A request has now been received from Oriskany Falls for the company to bring the line into that village, making a total distance of twelve miles to build. It is proposed to construct party lines, using 25-foot poles with ten-pin cross-beams. Toll stations will be instituted at the villages, while the subscribers will be given a flat-rate price. This extension will place the residents of those towns in direct touch with over 800 subscribers in this city. The Rome Home Telephone Exchange now has 825 telephones on its list and the number is constantly increasing. A new switchboard of 100 drops was ordered some time ago, but has not reached here.

SIDNEY, N. Y.—The Union Telephone Company, of Sidney, is extending its line from Rockdale to South New Berlin, to connect from there with Utica.

FREMONT, OHIO.—The Fremont Home Telephone Company is considering the matter of connecting Woodville with its local exchange, thus giving Fremont and Woodville subscribers the same service as is now enjoyed by Fremont and Lindsey.

MARION, OHIO.—The officers of the Marion County Telephone Company in a conference with W. Clay Houston, representing the Independent telephone lines in Logan County, and C. Dombaugh and Harry B. McMullen of Mt. Gilead, representing the Independent lines of Morrow County, made arrangements whereby the Morrow County Independent lines will connect toll lines with Marion between Adelaide and Denmark, and the Logan County Independent lines will build from Byhalia, Union County, into LaRue, and connect with the Marion system at that point. All these connections are to be made by Aug. 1, the Marion people meanwhile pushing their east and west toll lines to completion, in order to have the system ready to open with the inauguration of the Marion exchange.

These toll lines are merely the first to be put into operation, because they will give to Marion what has been so much sought after, connections in Morrow, Logan, Union and Hardin counties. The local company is making such progress that it is expected to be able to open the service with one thousand subscribers.

BRISTOL, PA.—The Standard Telephone Company, operating in Bucks County, has made arrangements for laying a cable from Bristol to Burlington. The cable will carry ten pairs of copper telephone wires. Within a few weeks the company's local exchange will be transferred to the building recently purchased.

CLEAR LAKE, S. D.—An extension of the lines of the Citizens' Telephone Company around Clear Lake will be made in the near future.

JACKSON, TENN.—Messrs. Jones & Winter have been awarded contracts for construction work on the exchanges at both Jackson, Tenn., and Paducah, Ky.

Miscellaneous

DE WITT, IOWA.—The DeWitt Telephone Company has made an extension of its lines northward.

INDUSTRY, ILL.—The Industry Rural Telephone Company wants to incorporate, but a minority of the stockholders will not agree. This company proposes to install an exchange in the village of Industry and rent instruments for \$12 a year, giving subscribers the use of the entire system.

THE WEEK'S MESSAGES *Continued*

ROCKFORD, ILL.—The Home Telephone Company now has over 1,200 subscribers, and the construction work is progressing rapidly.

MANHATTAN, KAN.—The Wareham and Wood Telephone Company has moved its central office into new quarters. There are at present 360 subscribers connected. H. P. Wareham has purchased and put in place an entirely new and up-to-date switchboard, with a capacity of 400 telephones.

ZUMBROTA, MINN.—The subscribers of the Zumbrota telephone exchange will soon have free telephone communication with the White Rock exchange.

ORANGE, TEXAS.—W. D. Bettis, director of the Orange Telephone Company, said the company will shortly have long distance connection with the Citizens' Telephone Company of Houston.

TRADE NOTES

THE EUREKA ELECTRIC COMPANY, Chicago, have just sent out a handsome and useful calendar for July. It is printed in colors on a single large sheet, the upper part being devoted to a display of some of their telephone apparatus.

THE ACME ELECTRIC COMPANY, Chicago, have moved to 194-200 South Canal street. The business of this enterprising company has had such a rapid and steady growth that this move was made absolutely necessary. They will occupy the entire ground floor of this commodious building.

THE KELLOGG SWITCHBOARD AND SUPPLY COMPANY, Chicago, has just received a contract for an additional 1,080 lines for the present equipment of the Los Angeles Exchange. This will give the exchange a total of 7,080 lines to start with.

THE UNIVERSAL TELEPHONE RECEIVER HOLDER COMPANY, Chicago, has a new piece of apparatus on the market which will undoubtedly appeal to all users of the telephone. It is, as the name of the firm suggests, a telephone receiver holder. The receiver of any ordinary telephone is clamped to an arm, placed at a proper distance, so that when the mouth is directly in front of the transmitter the ear will press against the receiver. The arm holding the receiver is connected by a rod to the switch hook, and pressing the ear to the receiver automatically calls central. To ring off, all that is necessary is to step away from the telephone. It is unnecessary to touch any part of the telephone with the hands, which for making notes or taking dictation from the telephone is a great advantage. Fatigue incident upon holding an ordinary telephone receiver to the ear for any length of time, which is obviated by this holder, is another feature which should not be overlooked. The company claim the following points of merit for the receiver holder, besides those enumerated above: The receiver being clamped in a permanent position cannot be broken. There is practically no wear on the receiver cords. The use of the holder precludes the possibility of a party, when through talking, leaving the receiver lying around on shelf or hanging suspended by the cord, thus permitting the connection to remain open. As soon as the conversation is finished connection is automatically broken.

THE KELLOGG SWITCHBOARD & SUPPLY COMPANY, Chicago, has sent out a very interesting leaflet on white cedar telephone poles. The article in full is as follows:

"It is a fact perhaps not appreciated in all its bearings by Independent telephone operators that the price of white cedar poles (freight excluded of course) has advanced in the last three years over 100 per cent.

"This is in part the result of the great demand caused by increased activity in construction of pole lines for the various electrical purposes, but the chief cause is the fact that the Michigan and Wisconsin cedar forests are becoming exhausted from the drain that has been put upon them, and producers are compelled to buy the uncut cedar at rapidly appreciating values. Another factor that has increased the prices of cedar poles is the ever

increasing length of haul from the stump to the railroad. A very few years ago, a long haul was a distance of a mile and a half; two miles was unusual. Now, four miles is considered not an unfair distance, and hauls of six and even seven miles are made.

We all know that the Independent telephone movement is now in full swing, but that it has more than fairly begun to fill the popular demand for telephones no one will claim. In other electrical industries development is also exceedingly active, and will be for many years to come.

"Every year will find a decreased supply of poles in the cedar swamps, and ever increasing length of haul for the producer and a demand on the part of purchasers that certainly will not decrease.

"The cedar producing area in the United States is exceedingly limited, east of the Rocky Mountains; the States of Michigan and Wisconsin, together with some Minnesota swamps, practically monopolizing the now comparatively limited supply of a never plentiful timber growth.

"Bearing these facts in mind, it is clear that the question of pole line renewals is an important one to consider from the view point of cost at the time the renewal must be made.

"Engineers of wide experience have expressed the opinion that a line constructed of four and five-inch top poles is far from being the investment that a line constructed of six or seven-inch top poles is, taking into consideration the difference in price of the poles themselves (of course labor, wire, etc., will cost the same in either case). We are referring now particularly to long lines in which twenty-five foot poles are used.

"The advantage of a six or seven-inch top pole is not by any means entirely in the size of the top. The butt's the thing. The increased stockiness of the pole mentioned means a very materially longer life to the line and less repairs and renewals. It also permits, by reason of its greater stiffness when set, and consequent ability to withstand strain, of running a line around a curve of large radius without the necessity of guying, where five-inch poles would require the additional expense involved by that method of construction. The small additional cost of the larger pole will prove in a few years an investment worth several times the additional initial outlay, while in the reverse case, "money saved will be money lost." A little higher price and a small additional freight charge paid now will be a source of congratulation before much time has elapsed.

"Sometimes the Bell Telephone Company is right. Experience extending over many years in building and maintaining pole lines means something. The Bell Company licensees rarely if ever use anything smaller than a six-inch top."

PLANTS FOR SALE

TELEPHONE PLANT FOR SALE—160 telephones, 100 miles of toll lines; excellent opportunity for extending business; will sell for \$12,000; pays 15 per cent. net on this amount. Address TELEPHONE CO., care of AMERICAN TELEPHONE JOURNAL.

WANTED

WANTED.—Position as wire chief or manager of an exchange of 1,500 or 2,000 subscribers in a clean Western town or city by a married man of temperate habits, with twelve years experience with the Bell Co., but now taking care of an exchange district with 1,500 subscribers for an Independent Co. Can give good references. Address L. M., AMERICAN TELEPHONE JOURNAL.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISSELL CO., Toledo, Ohio.

A FEW more men wanted to take advantage of our gilt-edged offer: 5,000 Toll Tickets printed, \$1.75. Independent Telephone Printers: THE SUN-PRESS, Stockbridge, Mich.

The American Telephone Journal

VOLUME VI

SATURDAY, JULY 19, 1902

NUMBER 3

UNDERGROUND CONDUIT CONSTRUCTION

By W. R. HARRIS.

This article received Third Award in the American Telephone Journal Prize Contest

AN UNDERGROUND conduit system is supposed to be a permanent structure and therefore too much care cannot be exercised in the design and construction of such work. The first thing to be considered is the kind of conduit to be used; some of the various kinds on the market are vitrified terra-cotta tile, artificial stone pipe, cement lined wrought iron pipe, wrought iron pipe, creosoted wood and fibre ducts.

Of the above, terra-cotta tile is the best, being strong, hard, smooth, everlasting and impervious to moisture; it has stood the test of time, and in the last few years a great improvement has been made in its manufacture.

The American stone conduit is to be preferred next to terra-cotta tile; it is composed of crushed stone and Portland cement, and during the process of manufacture is subjected to a great internal pressure which gives a bore of perfect diameter and polished smoothness, being much smoother than terra-cotta tile.

Wrought iron pipe should not be used for anything except short laterals, as it is subject to interior corrosion, although the exterior is preserved by the concrete envelope. All ducts should have a three-inch bore, whether used for laterals or in a main conduit.

A single duct tile is to be preferred to a multiple duct tile, as it gives greater flexibility of arrangement, thus allowing obstructions to be passed with greater ease; there is less loss in case of breakage; they can be staggered at manholes, as indicated in figures 1, 2, 3, and 4, thus allowing a better cable arrangement to be made in manholes. In making curves, an easier curve can be made with the single ducts, and in case of damage to the system repairs can be more easily made, as the tile can be split lengthwise and placed over cable (with the split joints on the side); after concreting, the system is as good as ever.

In adding a man-hole to the system, single ducts can be cut out and squared up so as to make a neater appearance than is obtainable with a multiple duct. The best feature of the multiple duct tile is the rapidity with which it can be laid.

Having decided upon the conduit to be used, the next question to be considered is how to lay it.

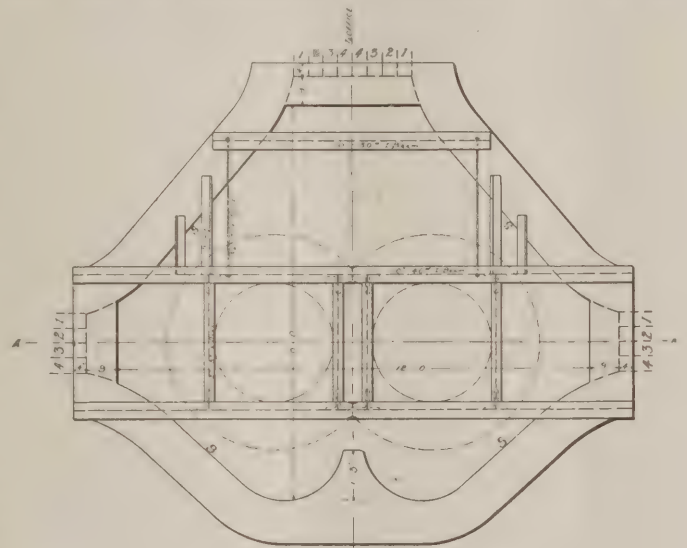
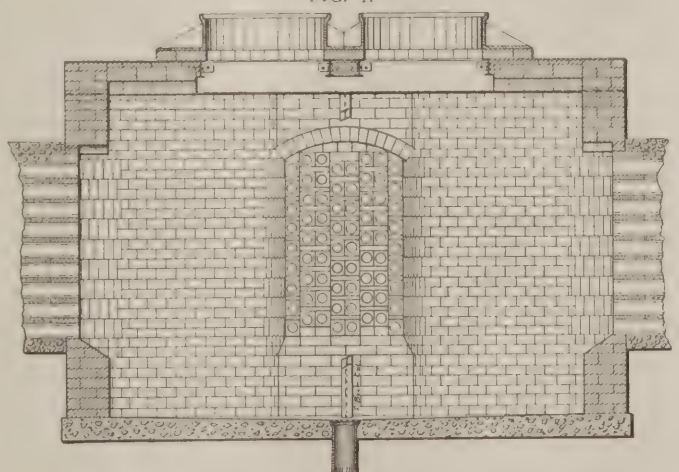
All conduits should be laid on a concrete foundation and enveloped in concrete the thickness of which should be not less than three inches, and preferably four inches. If laid as above the ducts will retain their alignment, are rendered practically water tight (if the concreting is properly done); are protected from injury by laborers with pick and crow-bar, and in case the

system is undermined by workmen the concrete will sustain the ducts for quite a span.

The conduits should be placed below all gas and water service pipes if possible, thus eliminating much of the danger to be feared from the employees of other companies. Such construction may be more expensive at first cost than works of shallow trenches, but when one considers the cost of repairing damaged ducts and cables, the rebates allowed for interrupted service, and last,



MR. W. R. HARRIS.

PLAN SHOWING BEAMS AND OUTLINE OF WALLS
FIG. 1.SECTION A-A
FIG. 1.

but not least, the dissatisfaction caused to the subscribers by such accidents, any additional outlay of capital expended for better construction is well invested. Ducts should be so arranged that the cable will be distributed equally on each side of the man-holes; for instance, 24 ducts laid in 6 courses of 4 ducts each would distribute 12 cables on each side of the man-holes in 6 rows of 2 cables each; 24 ducts laid in 4 courses of 6 ducts each would distribute 12 cables on each side in 4 rows of 3 cables each.

The best method is to lay all ducts in courses of 4 ducts each,

except in special cases, where another method would be more economical; for instance, in passing between two pipes running in the same direction the intervening space might allow the passage of 24 ducts in 4 courses of 6 ducts each when the same number of ducts laid in 6 courses of 4 ducts each would not pass through.

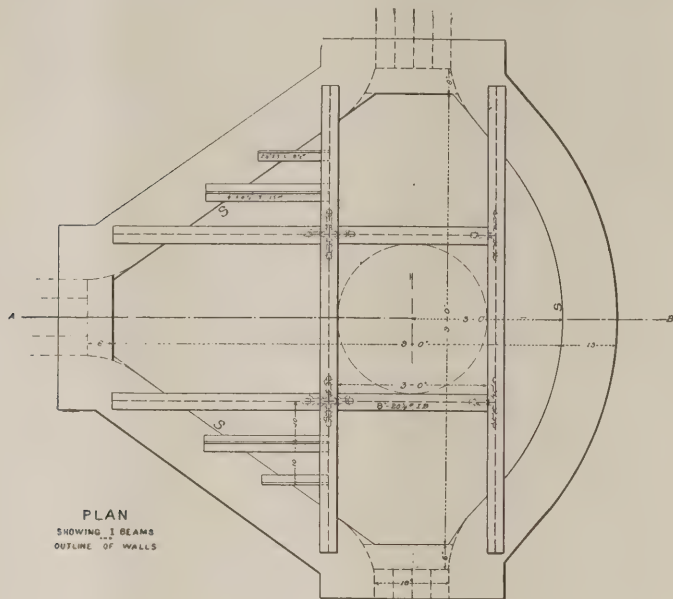
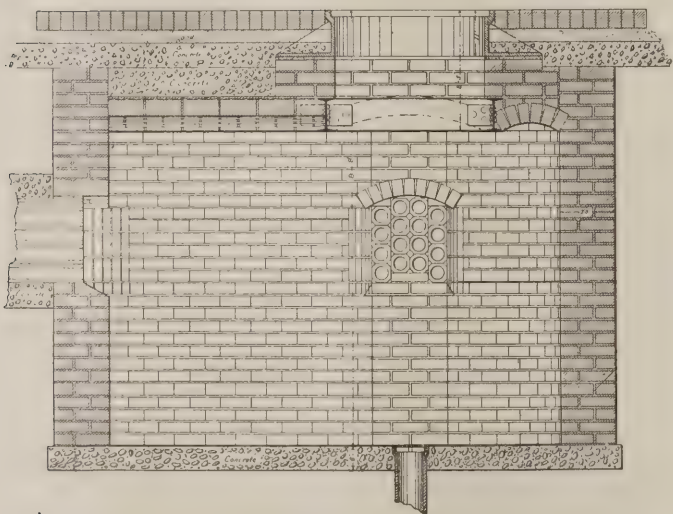


FIG. 2.

SECTION A-B
SCALE 1/2"
FIG. 2.

In case the lower pipe was a large main or sewer a judicious arrangement of the ducts might save the expense of digging a very deep trench. The same general plan should be followed throughout the system as far as possible for the sake of symmetry.

Before staking out the trench, test holes should be dug across the line of trench so as to ascertain the exact depth and run of other pipes so as to be able to avoid such pipes with the least possible expense. Ducts should be graded so that the fall is all toward one man-hole, thus avoiding pockets in which gas could accumulate, as such a state of affairs is possible where the ducts are drained toward both man-holes from the center of a section.

When possible ducts should be brought into the man-holes on the same line, as not only a better cable arrangement is thereby obtained, but a great saving in rodding the ducts is effected, as the rods can be passed from one section to the next section without unscrewing or disconnecting them.

Ducts should be laid true to grade and in a straight line, as any curves or deflections cause just so much more resistance in drawing in cables. When curves are necessary they should have as great a radius as possible and should be regular. The grade should be not less than 3 inches in 100 feet.

A rapid and accurate method of establishing points on the grade line, called "plunging a grade," is as follows. After establishing the grade points at the extreme ends of a section, set up the level directly over one of the points with two opposite leveling screws in line with the grade line; place the level rod on the grade point and measure the distance from the grade point to the height of the instrument; set the target of the rod at the distance found and clamp tightly. Place the rod on the extreme grade point and depress or raise the level, by means of the two leveling screws in line with grade line, until the horizontal cross-hair intersects the target; tighten the leveling screws and grade points can be established any place in the grade line by moving the rod to the desired point and again intersecting the target with the horizontal cross hair, when the base of the rod will be at the desired grade elevation. Instead of measuring the distance from the grade point to the height of the instrument directly, a stake can be driven at lower end of the section on a level with the grade point at the other end. By setting up over the grade point and placing the rod on the stake

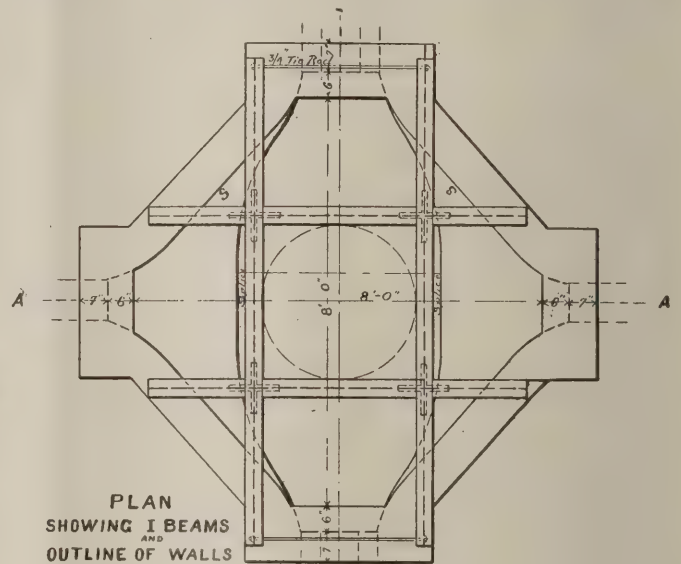
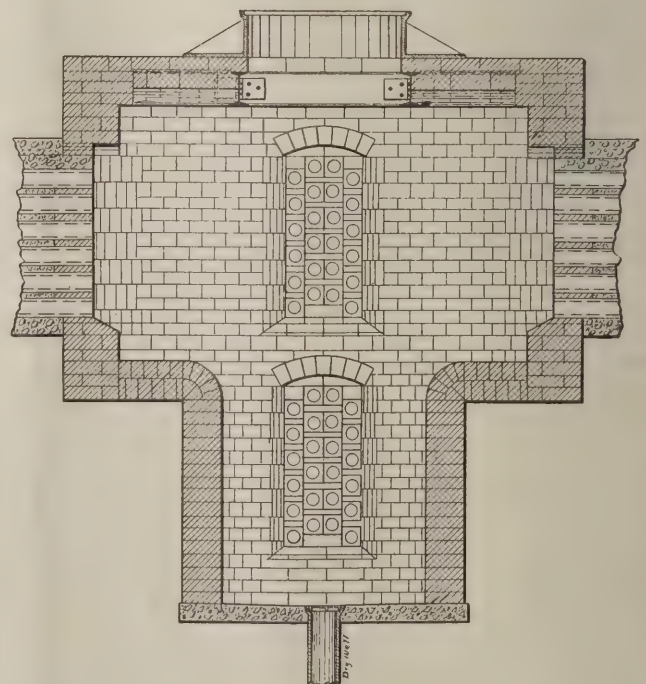


FIG. 3.

SECTION A-A
FIG. 3.

that is level with it, the target can be accurately set and clamped; then place the rod on the grade point at the same end and depress the level until the horizontal cross-hair intersects the target, tighten the leveling screws and the grade points can

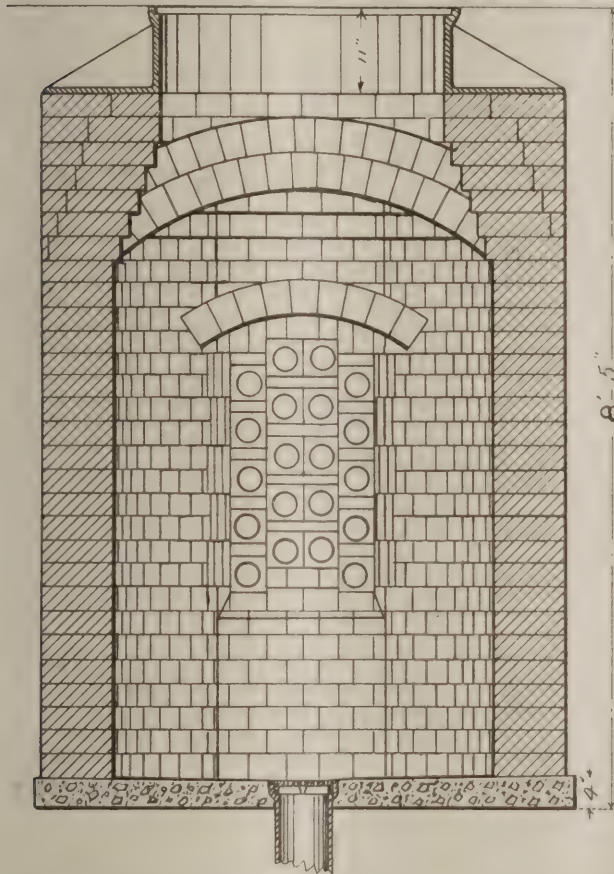
be established as before described. The distance between the grade points should be about 25 feet. Draw a strong light cord tightly over grade points and grade 3 or 4 inches, as desired, below the line when the trench is ready to be concreted.

One inch of crushed stone or three-quarters of an inch of gravel should be used in the concrete, in the following proportions: 1 part Louisville cement, 3 parts sand and 5 parts clean gravel or crushed stone. The concrete should be well mixed and wet enough to ram easily. A good rammer for obtaining a smooth surface can be made of a two-inch piece of oak 8 inches wide by 18 inches long, shod with iron and having a handle about 8 feet long or more, so that the person using the rammer can stand on the street surface and ram the concrete as it is thrown in and leveled to grade. Allow the concrete to set and harden before attempting to lay ducts.

All ducts laid with a mortar joint should have a mandrel, with a washer at the end, drawn through as the laying proceeds; the washer will scrape off and smooth any mortar that may enter the joints. Lay the tile with broken joints and cement around same well, have a mortar joint of about one-half inch in thickness

with brick or concreted, preferably the latter, with a finishing coat of Portland cement mortar one-half inch thick.

Dry wells, bored to gravel, should be used or drainage in preference to sewer connections, as the latter afford an entrance for sewer gas; although traps may be provided, the water in



SECTION A-A.

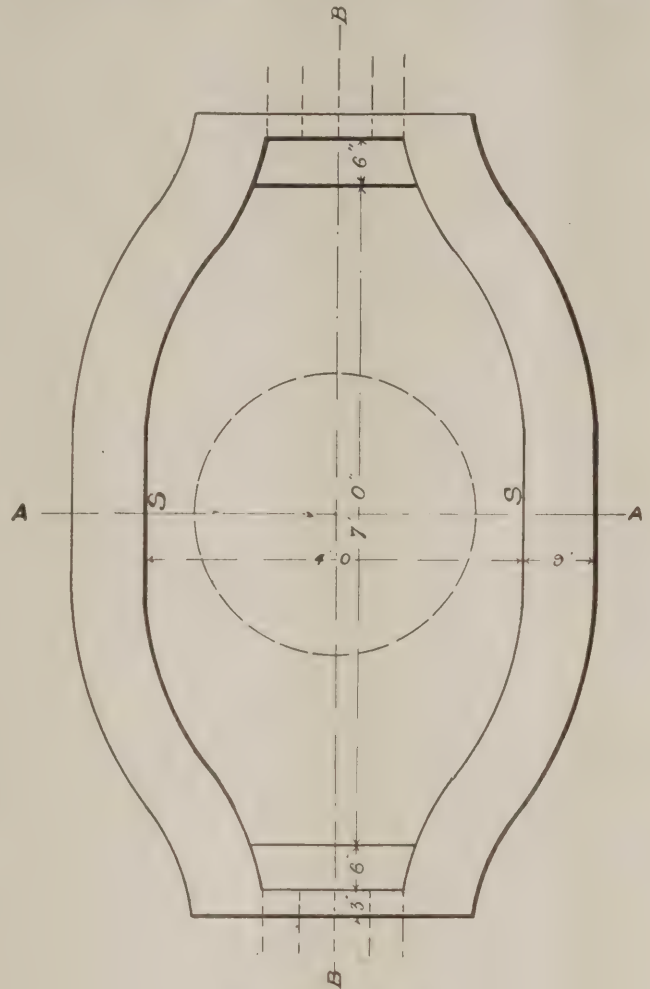
FIG. 3

between each course of ducts. Concrete around and over ducts, after the mortar has set and hardened; ram the concrete so as to ram same well, but be careful not to disturb the ducts. After the concrete has set, back filling can be commenced, tamping the earth well as it is thrown in.

At the end of the day stop the ducts with wooden plugs, cementing over same, so as to keep out dirt, etc., in case of rain; the plugs can easily be removed the next morning. There should never be a less distance than two feet and a half between top of ducts and surface of street. Sections of conduit should not be over 500 feet in length and preferably only 450 feet.

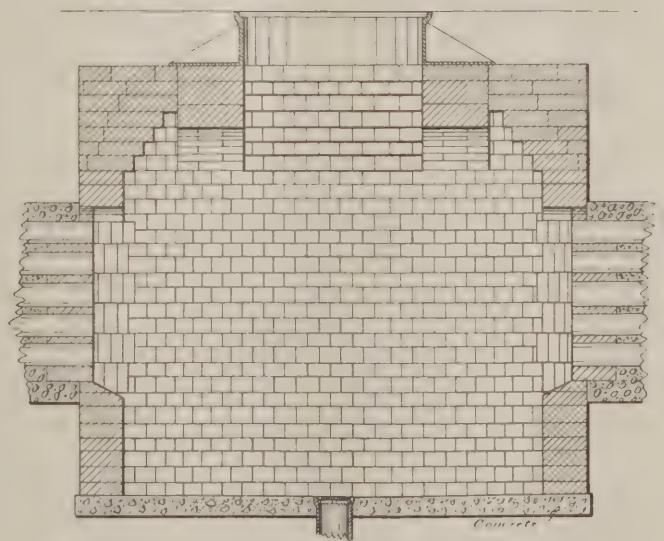
MAN-HOLES.

Various types of man-holes are required to meet varying conditions, but they can all be considered as modifications of the plans shown. The depth of all man-holes is governed by the number of ducts and depth of laying. There should never be less than two feet between the bottom of the ducts and the bottom of the man-hole. The bottoms of man-holes can either be paved



OUTLINE PLAN

FIG. 4.



SECTION B B

FIG. 4.

them may be exhausted by evaporation or syphoning. A remote contingency that may arise is the backing up of water in the sewer caused by an obstruction in the main sewer or a heavy rainfall that overtakes the capacity of the sewer system. Provide dry wells with perforated covers.

By setting the ducts back in the wall and rounding the cor-

ners as shown the cables can be shaped to fit the man-hole without kinking the lead sheath. Splices in cables should be made where marked "S" on plans. All iron work should be painted with two coats of P. & B. paint before being placed in position and should be free from rust, oil or dirt before the paint is applied. Man-hole covers should be perforated for ventilation purposes.

The staggering of ducts as shown in the illustration applies only in the part of run near man-holes being started about ten or fifteen feet from man-hole. Use round man-hole covers, as round lids cannot be dropped into man-holes by careless workmen.

Fig. 1. shows a double man-hole to be used as an office man-hole, where a large number of ducts enter the building. Cables entering in rows of ducts marked 1 and 2 run along side walls of man-hole to office ducts marked 1 and 2. Cables entering in rows of ducts marked 3 and 4 run along back wall to center of manhole and thence to office ducts marked 3 and 4. The latter cables are supported on cable hangers attached to five-inch I-beam columns placed under the two main ten-inch I-beams. The roof is constructed in the manner indicated, the I-beams being connected with standard connection angles as shown; brick arches are built between the beams. Where it is impracticable to continue the brick arch, angle irons can be placed as shown and brick laid on edge between them. It is well to have an extra course of brick between the I-beams and the man-hole castings where the grade of the street is likely to be changed, thereby saving the expense of taking up and resetting the roof beams if the street is lowered. Such changes are likely to occur

on old macadamized streets when they are improved with asphalt or vitrified brick paving. Fig. 2 represents a man-hole that can be used for an office man-hole where only a few ducts are to be accommodated, or it is suitable for a junction hole where only one route branches off from the main line. The roof is constructed of I-beams and brick arches, angle and T-irons, as indicated. Fig. 3 represents a man-hole to be used where two routes branch off from the main line. The upper set of ducts is for cables running to the side routes, rows 1 and 2 main route corresponding to rows 1 and 2 side route, rows of ducts marked 3 and 4 likewise. The side route ducts enter the man-hole in courses of two ducts each but about 15 feet from the man-hole change to a formation of four-duct courses. This enables a better arrangement of cables to be made. By staggering the ducts at man-hole cables can be so arranged as not to block any vacant duct.

Fig. 4 shows a man-hole for a straight run of ducts where no branches are to be made.

By building the roof arches as indicated, no I-beams are necessary, and the only iron pieces in the structure are the man-hole cover, perforated dry well cap and cable hangers. I have taken scales of rust 3-16-inch thick from the webs of I-beams in damp man-holes and do not approve of the indiscriminate use of iron in man-holes. There is often serious inconvenience from its rapid corrosion. In such cases as shown in Figs. 1, 2, and 3 I-beams are essential, and wherever such construction is adopted the man-hole should be inspected and the iron-work cleaned and painted not less than once a year, and oftener if found necessary.

DRY vs. WET BATTERIES FOR TELEPHONES

By A. E. DOBBS.

DRY batteries are now so cheap that a great many telephone companies prefer to use them exclusively in their telephones, thinking it greater economy to buy these batteries and throw them away when they run down than to waste time in renewing wet batteries.

In this connection it might be interesting to cite some results obtained by the Cuyahoga Telephone Company in Cleveland, who made a three months' test of batteries of all kinds. This test consisted in connecting all the batteries to a clock which would cut them in for five minutes and cut them out for fifteen, through a resistance of 35 ohms during the entire twenty-four hours.

This test was continued for three months with the result that some of the best makes of dry batteries showed up better than most of the wet batteries used in the test. Most of the dry batteries had an initial strength of 1.53 volts and stood the test longer than any except the very best of the wet batteries, while their first cost was only about one-third as much. This is further confirmed by the results obtained by some local exchanges who could only obtain about four months life for the best wet batteries they had on some railroad and other busy lines but could get about eight months' work from dry batteries. When we consider the time lost by the inspector in renewing wet batteries it is plain that dry batteries are considerably the more economical. For example, an inspector in going to a residence for renewing batteries must take his cells to the kitchen sink, wash them out, clean the carbons, clean the zincs, and renew the charge entailing a cost of at least fifteen cents for every renewal, while dry batteries can be purchased for less than fifteen cents apiece. It is therefore plain that in this case the dry batteries are the more desirable even if they have to be thrown away after nine months' use, to say nothing of the fact that the inspector can take about twenty-five of these cells in a basket and make his renewals, throwing the old ones into the back yard or bringing them to the office as may be preferred.

The best way to purchase these batteries, however, is direct from the manufacturer, for in that case they are more likely to be fresh. One of the weaknesses of dry batteries is that they are liable to lose their strength when standing on a shelf and not in use for a long time.

A dry battery should always be placed in an upright position for it has been found by salesmen and others who have to carry them around the country that when placed on their side in a grip or trunk they deteriorate quite rapidly.

SAL-AMMONIAC BATTERIES.

To keep a sal-ammoniac battery, or any other open circuit battery for that matter, up to its proper condition requires constant supervision on the part of the inspector.

A telephone using local batteries should be inspected once a month, and all the signs of deterioration in the battery carefully noted. Whenever salts begin to form on the zinc the crystals should be scraped off and perhaps more water added. The water line should always be kept up to the shoulder of the jar.

One mistake frequently made by green battery men consists in putting too much sal-ammoniac in the jar.

If the batteryman would simply put in no more sal-ammoniac than could be dissolved by the water in the jar he would obtain better results although it is well to leave a *little* more sal-ammoniac to allow for future absorption of this salt. But filling the jar half full of sal-ammoniac is not only a waste of material but it actually lessens the voltage of the cell by setting up a counter e. m. f. which produces creeping of salts.

GRAVITY BATTERIES.

The gravity or blue-stone cell is totally different from the sal-ammoniac or open circuit cell and is intended for a totally different purpose. The sal-ammoniac cell does not have any local action or, at least, very little, when not in use, whereas, if the gravity cell is not doing work it immediately sets up a local action in which the copper is deposited upon the zinc instead of the copper electrode. Therefore, in order to keep it in its best condition the gravity cell demands a certain amount of work. They are often used on operators' transmitters which are in circuit all the time. Their high internal resistance is an objection to their use.

In the inspection of any large number of these cells particular attention should be paid to the color of the fluid in them.

The blue line should be about half way between the copper and the zinc. With an old cell, this blue line falls to the level of the copper element showing that the "zinc water" predominates. When this is the case the water from the bottom of the jar should be drawn off by a syphon syringe and replaced with fresh water.

The sulphate of copper (blue-stone) should cover at least half the copper electrode.

In setting up a new cell it is necessary to let it stand short circuited for a few hours in order to bring it up to its full strength.

OPERATING: BY AN OPERATOR

By SUSIE WIEGLER*

I HAVE been a telephone girl for more than five years. I began with one hundred lines, and now take care of one hundred and eighty subscribers, four toll lines and several farmers lines.

I am going to give you a few of my experiences and tell you how I operate a "small exchange." In the first place, to make a good operator one must have an angelic disposition, the patience of Job, a good, clear voice, and, above all, the faculty of hearing should be perfect. A good operator should always speak right into the transmitter, not talk too loud nor too fast, but just like one would if the people were actually present in the same room.

Never take your board when you are out of humor, for if you do everything is sure to go wrong. Above all things, answer calls promptly and accommodate the subscriber in every way that you can. Some, at least, will appreciate it. In a short time you will learn the ways of the different people and will know just exactly how to deal with them. You are put at your board to oblige and to accommodate the subscribers, and must speak pleasantly to them. In the telephone business, as in any other, you have some "cranks" to deal with. So we, too, must sometimes be "cranky."

A subscriber may call for a number, and suppose he doesn't get an answer right away. When the accommodating operator goes in on the line to see what she can do for him he will say in a tone of voice that will make the operator feel badly: "Is this Central? Well, why in the world don't you give me number so-and-so?" just as though she had made no attempt to make the connection. She will say: "You are connected now, Mr. Blank." "Well, what's the matter with the old 'phone?" "Nothing that I know of, but I will ring them once more for you." Now, in the first place, if the line or instrument had been out of order you would have told him so, and not have made the connection or left him in doubt.

Suppose he is trying to get a "station agent." When you have done your best and failed to get him, all you can do is to offer a word or two of consolation. Just say to him: "Perhaps he is out checking freight or is busy at the wire." Now, it doesn't make any difference how impatient the subscriber has grown, he will thank you, hang up the receiver and go away in a good humor.

Still, I have had a subscriber ride half a mile to one of our stations to see why he could not get an answer from that station. Well, he got there all right, but to find the agent was busy in the stockyards. And so it goes.

Watch all connections closely, for so few people ring off. Many a time when you go in on a line to see if the parties are through talking you will hear one of them giving Central credit for something she is not doing. Say one of the tele-

phones is "cutting off." They never stop to think the trouble may be in the instrument or the line, but are saying, "I wish Central would attend to her own business and quit cutting us off." Of course that is a little hard to stand, and you make up your mind to call them as soon as they are through talking and tell them just what is what.

But think! Isn't it much better to say you think the fault lies in the instrument or line, and that you will report the trouble and have it attended to as soon as possible? Most of the subscribers expect you to always be giving them the correct time, to tell them who is dead and when they are to be buried, to be able to report on all the sick cases, to keep track of all the trains, to tell them what a certain bell was ringing at that time of day for, and what young man that was that walked down the street with their neighbor's girl, and what number called them two or three hours ago, and if any one wanted them while they were away from home, and where the fire is, and so on.

Well, answer them if you can. It won't hurt you, and it will speak well for you and the company that employs you.

If you have a couple of crossed lines and have a call for one of the numbers before the trouble man has had time to do his duty, you ought never to connect them unless you go in on the line and explain to them which one you are calling. You should be very careful about your toll calls and get the parties wanted as soon as possible. If you have to send for a non-subscriber, don't neglect it, for it is so disgusting to any one to have to sit or stand around and wait, for to them the minutes seem like hours. If the messenger boy is out, don't wait for him to return, but call a place of business or a house nearby, where you think there is a little boy that would like to make an honest dime, and send him. In fact, do any way you think best to get the parties together, for what you want in the telephone business is quick service and quick results.

On the farmers' line you must teach the farmer just how to use his telephone, or in a few weeks he will be teaching you how to run your board.

Don't neglect to report trouble to the manager; never repeat anything that goes over your board, for it is none of your business, and you may get yourself into trouble.

I think it is a good thing for each operator to understand all about her board and the instruments, and be able to trace all inside troubles.

There are lots of ups and downs in a telephone girl's work, and there are pleasures as well. Of course it is a little confining, but the only real objection that I have to being a "hello girl" is that there is not enough money in it. I don't believe any operator ever gets as much as she really deserves.

THE TELEPHONE HOG—A QUERY

We have a number of farmers' party lines connected with our exchange, the usual number being from four to six subscribers on one line. Lately we had a case of a farmer on one of these party lines, which we will designate No. 1, call another farmer also on a party line, which we will call No. 2, and these two farmers held the line for seventy minutes.

The only subject of their conversation that the operator heard when she cut in occasionally was talk about a horse trade and neighboring gossip of no special consequence to anybody. Meanwhile, there had been a number of outside calls for other parties connected to the same lines (the operator said there were at least a dozen) one or two of which seemed to be very urgent.

The operator finally forced a disconnection by pulling the plugs, asking them to wait a minute, and ringing the parties wanted.

Now, when a man pays for a telephone he has a right to use it, theoretically at least, as much as he pleases, and there is also an old law saying that possession is nine points in law. But what are the rights of the other parties on a line of that kind, and what ought we to do in such a case?

There are several other farmers on these lines who call up one another and talk about trivial matters, to the exclusion of others on the same line.

At the rates we offer these people we cannot afford to give them separate lines and do not like to offend them, but would like to know how we can best manage such a case, and at the same time retain their patronage, while doing justice to all of the subscribers alike?

This is probably one of the most difficult questions confronting the manager of party lines.

A conversation lasting from ten minutes to half an hour might be a very important one to the parties interested. Even a conversation about a horse trade or the breeding of hogs might be important enough to represent a considerable money value. At the same time, the operator is not generally the proper person to decide whether a conversation is important or trivial enough to warrant her in breaking it up.

The only thing that we can suggest is that there should be a printed rule on all directory covers to the effect that conversations over a party line are limited to ten minutes, provided there are calls for other parties on the same line.

This rule need not be strictly enforced, at the same time there might be a call for parties on such a line from a man who had an important business engagement or was compelled to take a train, and the cutting off by the operator for two or three minutes would work no hardship to the parties in question.

This, it seems to us, is a fair rule that no reasonable person could object to.

This is the only remedy that occurs to us at present.

We should, however, like to get the opinions of our readers on this point, for it affords a chance for an interesting discussion.

*Miss Wiegler is an operator at Plattsburg, Mo. Her article was submitted in THE AMERICAN TELEPHONE JOURNAL prize story contest.

Opinion and Comment

SERVICE BY THE MESSAGE

THE suggestions put forth by Mr. F. C. Redfield in the article on Measured Service, which received second award in the AMERICAN TELEPHONE JOURNAL'S Prize Contest, printed in our issue of July 12, merit consideration on the part of enterprising telephone managers. Mr. Redfield's ideas, briefly recapitulated, are that the subscribers should buy their station apparatus and pay for the cost of installation and interior wiring; the telephone company would own the switchboard and line plant, and would charge the subscribers so much a message used, the cost of the service to the subscriber depending absolutely on his use of it. Mr. Redfield puts telephone service on the same basis as gas or electricity supply, where the supply plant and distributing system are owned by the company, the house apparatus and fittings by the consumer, and the latter pays strictly in accordance with the amount of gas or electricity consumed.

It is apparent to any close observer that the business methods as well as the technical processes of telephony are changing, and will probably change still more in the future. Whether Mr. Redfield's estimates of capital cost and operating expenses are correct or not, and whether his ideas of traffic and price are sound, are matters of detail not worth discussing at present. But whether such a radical innovation in the method of supplying telephone service is likely to be a success, either now or in the future, is a question well worthy of the fullest discussion. That telephone service sold purely and simply by the message would be popular with the public is highly probable. That it would be profitable to the telephone company, in the present stage of the development of the telephone, is open to question.

There are fundamental differences between electricity and gas supply and telephone service that militate against the pure message rate, at least until the general public, the average user, shall have got into the habit of using the telephone very much more frequently than at present. The gas or electric system is a system of large units and of mains, and the part of the plant individual to each user is a very small proportion of the whole. The telephone system, on the other hand, is an aggregation of small units. The lines are each one individual to a single user, and the switchboards and exchange plant generally are simply collections of apparatus, each unit of which has an individual user. In gas or electric supply it makes comparatively little difference what each individual user demands; the aggregate, or the average, is what counts. There is storage for periods of excessive demand, and when the demand is slack part of the machinery can be shut down.

In the telephone service the demand of each individual user makes all the difference in the world. Just as the telephone plant is an aggregate of small units, so is the telephone traffic an aggregate of individual transactions. At the present general average rate of use this traffic is not large enough to use the plant economically or to make a rate based on the message pure and simple profitable for all lines. The general average of use is about seven or eight calls a day, which means that a few lines are used very heavily, and many are used only to a very small extent. Even if the average use were spread uniformly over all lines eight calls a day would mean a total use of the line of only half an hour daily. At a price of two cents a message the revenue produced would not be sufficient. But since many of the lines do not yield a traffic of more than two or three calls a day the message rate would be hopelessly unprofitable as regards a large proportion of the consumers.

Selling to the subscribers the station equipment and inside wir-

ing is an ingenious device for getting the consumer to pay part of the capital cost of the system usually borne by the telephone company, with the additional advantage of having a tendency to secure steady consumers. But it hardly goes far enough. Why not also make the user pay for his line, which is just as much for his exclusive use as his station and inside wiring? The company would then need but a comparatively small capital and the customer, owning the line and station, would have a strong incentive to use them frequently and to originate many messages. If, however, the general public can be so educated to the use of the telephone that the *minimum* use of any line would be seven or eight calls a day, and the average fifteen or twenty calls a day, thus ensuring a fair load factor for each line, the telephone company could afford to own the entire plant as at present, and charge the users simply by the message. The growing use of the telephone by all classes of the community would seem to indicate that the day when a message rate pure and simple will be a practical scheme is not so very far distant.

A CANADIAN DECISION

THE Bell Telephone Company operating in Canada has run against the courts of that country, and finds, among other things, that it did not receive the same light treatment it has been used to by American courts. The trouble all started by one of the subscribers refusing to sign a contract which relieved the company from all liability for damages caused by defective wiring. The company sent him an ultimatum declaring his service would be dropped if he did not sign. He appealed to the courts, obtained a temporary injunction restraining the telephone company from depriving him of service, and eventually secured an order from the court directing the company to serve him as long as he paid the same rental as other subscribers.

The court in rendering the decision took the position that a company having a practical monopoly in such an important industry as telephony is bound to serve patrons on terms which are fair to both parties. The company has no right to try and shirk obligations which it is only right and proper for it to take, and also has no right to decline to serve a patron who pays the prescribed rental for service. When a corporation is granted a franchise that is in effect a monopoly, says the Canadian court, it is taken as a matter of course that they acquire only privileges and not obligations.

WINNER OF THE THIRD PRIZE

MR. W. R. HARRIS, as stated before in THE AMERICAN TELEPHONE JOURNAL won the third prize of \$20 in our prize article contest. Mr. Harris' article on "Underground Conduit Construction," is printed in this issue.

Mr. Harris is engineer and division superintendent with the G. M. Gest Co., subway contractors, of New York and Cincinnati, and is at present superintending the subway work being constructed for the Cincinnati Gas and Electric Company. He began his business career, after leaving the Louisville Manual Training School, in a machine shop, where he served for a year. Here he gained much practical experience, which served him well in his after years. His next employment was as draftsman with the Snead-Van Alstine-Meldrum Company in their Architectural Iron Works. Then he entered the telephone field, serving as inspector, stock-keeper, draftsman and engineer consecutively with the Ohio Valley Telephone Company. This company was absorbed by the Cumberland Telephone and Telegraph Company, who retained him as engineer at Louisville, Ky. After remaining in this capacity for six years, he resigned March 9 of this year to accept the position he now holds with the G. M. Gest Company.

FIFTY DON'TS TO TELEPHONE LINEMEN

By EDMUND LAND

DON'T start out on a job of wiring without first checking over tools and supplies, as nothing is more annoying than to arrive on a job and find that something has been forgotten. The following is a good "kit" for use on all ordinary jobs: Small claw hammer, small rivetting hammer, small jeweler's soldering copper, one-pound soldering copper, large and small screw-drivers, corner brace, augur bits to-fit bushings used. One each, size 1-4, 5-16, 3-8 in. long drills, pliers, slim-nose-side-cut, and diagonals, scissors, good blow torch, Yankee automatic brick drills, plugging chisel and a good wood chisel.

SUPPLIES.

Rubber covered and braided twisted pair wire; rubber covered and braided single wire, Nos. 14 and 16; tubes of different sizes; flux, solder, tape, saddle tacks, plastic alloy ground clamps or some other kind of ground connectors, cleats, protectors, screws, expansion sleeves, toggle bolts.

2. Don't, on arriving at your job, walk in without announcing yourself, unless the place is a public office of some kind.

3. Don't start to run the wires from the cable box or drop, whichever it may be, until you have ascertained just where the telephone is to be located. Then look over all routes carefully and decide on the one which will in your judgment be the safest — i. e., the least liable to trouble from accidental contact with pipes, other wires, etc.

4. Don't leave joints on inside wires without soldering, unless a copper connector is used.

5. Don't leave joints uncovered; *tape* them.

6. Don't use a smaller wire than No. 16 B. & S. for leading-in wires from the outside line, and use rubber covered and double braided.

7. Don't bring both leading-in wires through the same hole, as this is liable to cause trouble.

8. Don't locate your holes for leading-in wires closer together than two inches, and where it is possible to do so use porcelain tubes and place them where water drip will not be liable to cause trouble.

9. Don't forget to give your wires a loop or water drip outside the tube entrance.

10. Don't forget to solder your leading-in wires to the line wire. A stub on the end of line wire is usually left after the line wire is tied to the insulator for this purpose.

11. Don't drill holes for leading-in wires without giving a slight slope downward towards the outside.

12. Don't fix the test block or protector without giving the matter some thought, as a protector should be kept away from anything inflammable, such as curtains or draperies, and should not be mounted close to gas or water pipes or electric light or other wires. Choose a place as dry as possible and as near to the place of entry as possible, and always keep in mind that protectors must be looked at occasionally when trouble occurs, and should be in a place easy of access.

13. Don't mount protectors or any other piece of apparatus with nails. This is bad practice and may occasion much trouble and expense later. Mount firmly with a full complement of screws. A porcelain protector block is generally used.

14. Don't run any further with the ground wire than is absolutely necessary, and use for this purpose not smaller than No. 16 B. & S. rubber covered and braided.

15. Don't run your ground wire under tacks, but put up carefully, and take precaution to mount and insulate from other wires, pipes, chandeliers, etc., as you would if you were running an electric light lead. Use porcelain knobs where possible, and if there is an objection to these use porcelain cleats.

16. Don't connect ground wires to a gas pipe if by going a little farther a water pipe can be reached.

17. Don't run the ground wire to the nearest place on a water pipe if by going a little farther you can attach to a pipe close to place of entrance of pipe and outside of all "building joints" in pipes.

18. Don't connect to a gas pipe without ascertaining if the meter is in, and if it is not, bond both sides of the pipes at the meter coupling in a careful manner with a heavy wire and solder the same or attach it as you would the main ground.

19. Don't solder to a water or gas pipe if a plastic alloy

ground clamp or Edison plastic alloy paste can be obtained. If gas or water pipes are not available drive a ground rod.

20. Don't fail to appreciate the fact that *ground* wires should be well insulated.

21. Don't try to solder to a water pipe without first draining out the water, as the result is unsatisfactory and the attempt tiresome and expensive.

22. Don't leave the protector without first making sure that all connections are tight, all parts adjusted, carbons cleaned, and the mica properly inserted. If the protector is arranged for soldering connections by all means solder.

23. Don't use paraffin wire, but run from the protector to the telephone with a good quality rubber covered, braided and twisted pair wire. This is least expensive in the end.

24. Don't do any more concealed work than is absolutely necessary, as open work, while not looking as well, is by far the best; it is easy of access and less liable to trouble from numerous sources. When possible run wires in basement, cellar, or attic.

25. Don't run wires in basement by stapling to joints or plaster. Use porcelain cleats if possible, and if this is considered too expensive use wood cleats which have been previously treated with some insulating compound. If cleats are not handy, try enamelled screw eyes. In default of having any of the foregoing, fasten wire up with saddle tacks over both wires, taking care not to drive too tightly. If coppered bare staples are used drive over *one wire only*.

26. Don't use tacks at all unless it is impossible to do otherwise.

27. Don't drive tacks over both wires any more than is necessary.

28. Don't draw wires through hollow partitions any more than is necessary, and when so doing use extra heavy insulation, as wires when exposed are more easily kept free from trouble.

29. Don't run wires through floors and ceilings except through tubing of some kind.

30. Don't run your wires over or under electric light or other high voltage wires except through porcelain tubes. Tubes must be fastened to wires by taping at both ends.

31. Don't think that because the other wires are insulated and those you are running are also insulated there is no danger. Make as sure as possible by protecting wires at points of crossing as specified in paragraphs 29 and 30.

32. Don't run through interior brick walls or partitions without either protecting wires with porcelain tubing or circular loom conduit. If the wall or partition is dry, circular loom tube is very good, and in this case both wires can be run through the same tube.

33. Don't use paraffin wire for installing telephones, as most common battery systems use from 24 to 40 volts on the line and this demands almost perfect insulation.

34. Don't run your wires in the same channel with electric light wires and pipes if it can be avoided. In a large number of buildings this must be done, but in such places a lead covered wire should be used.

35. Don't go away leaving the telephone set improperly mounted, but put in at least four fastenings; take pains to have the telephone hanging vertical, as nothing is more unsightly than a telephone set leaning over to one side.

36. Don't always try to fasten wall telephones with screws. On some walls, such as tile, a toggle bolt is better, and on brick walls expansion shields are best.

37. Don't mount extension bells on a ceiling, as this is scarcely a good place for them.

38. Don't locate your battery, if batteries are used, in a damp cold place; if placed on a shelf ascertain if the shelf is subject to much vibration from any sources; if so some precaution must be taken to keep the cells from jarring off.

39. Don't locate a telephone on a wall which is subject to much vibration.

40. Don't mount a wall telephone on a chimney breast by plugging the wall with wood.

41. Don't forget when placing a desk telephone to be very careful and particular to mount all necessary parts so that the minimum amount of damage will be done to the desk, and if a

subscriber seems over particular on the point do not judge him harshly, as you are not in a position to know how much he may have suffered from careless workmen in the past.

42. Don't make any slighting remarks in reference to any workmen who have preceded you, as such remarks tend to cause the subscriber to form a poor opinion not only of you but of the company for which you work.

43. Don't say any more than is absolutely necessary.

44. Don't forget on finishing a job to pick up all pieces of wire, place all furniture back where it was, and if any dirt or litter has been made in placing the wires, take pains to clean it up.

45. Don't forget to make an entry in your notebook—i. e., the name of the subscriber, location, class—residence or business, type of telephone, time of connecting, time consumed in doing the work, and any data which may be of value later.

46. Don't think that the man who finishes a certain piece of work the quickest is the best man, as time is not the only factor to be considered. Substantial work counts for more than mere quickness.

47. Don't return to the exchange or leave the job without testing out the telephone with the exchange.

48. Don't think too lightly of your occupation, as a wireman who can be depended upon to do at all times a thoroughly first-class and workman-like job and is steadily reliable is sure of promotion to a good position. Telephony is a growing business.

49. Don't on any account be careless with battery solution. Cases are known where a workman has poured the contents of old cells on the grass with the result that the owner of said grass has succeeded in making the exchange manager miserable, periodically and regularly, for some years later.

50. Don't think that the foregoing set of "DON'TS" are a complete specification to inside wiremen. Far from it. They are intended as a few hints only. The skilled requirements of an inside man are necessarily large, as he must be somewhat of a carpenter and know to a large extent how buildings are constructed. He must be also "a handy man," must be able to use soldering tools and know how to do a neat and clean job in all cases.

IN THE OPERATING FIELD

TELEPHONE EXTENSION IN SOUTHERN INDIANA

THE Independent telephone movement in Southern Indiana is on a decided boom. In the news columns of this issue of THE AMERICAN TELEPHONE JOURNAL is an account of connection being established between the New Telephone Company, of Indianapolis and nearly every city in the southern part of the State. In commenting on this prosperous outlook in an interview recently, Mr. John F. Slinkard, of Bloomfield, one of the men most interested in Indiana Independent telephone development, said:

"We have done a great deal of work of this character in the last few months. Our lines have been extended all over the southern part of the State and we have still other extensions planned that will improve the service very much.

"We have met with the greatest encouragement in putting in lines. The people are coming to realize the value of telephones and are making a big demand for them.

"It is surprising the way the farmers of the State are beginning to use the telephone. We have many subscribers among the country people and the list is growing all the time. The telephone is really a great economy for the farmers as well as being a convenience. The farmer can put himself in communication with the nearest market at a moment's notice where formerly he had to make a trip to the adjacent town to get quotations on his products. He can also transact much business over the 'phone that formerly required a trip to town. In a busy season to take a day off from his work to go to town means a big loss to the farmer. A telephone in his residence pays for itself in this way alone. In addition to this, think of the convenience it is to a farmer to be able to communicate with the city and with his neighbors as well about any business or social matter in which all are interested. The Independent lines are gradually becoming well established all over the State and it will only be a short time now until it will be possible to reach any point in the State over our lines."

A SUGGESTION TO TELEPHONE INVESTORS

A WRITER in the New York Press records the following not quite novel use of the telephone, and seems to think there is a field for the regular supply of music by telephone.

Mr. Pollman has twenty-two telephones in his place, each near an orchestration worth from \$500 to \$20,000, and dry goods merchants who are late for dinner at home drop in there to regale their wives with the latest operas as an excuse for not responding promptly to the announcement, "Dinner is served." Mr. Pollman asks: "You have wife? Children? Family?" You may reply in the affirmative. He places you in a telephone box and turns on the "moosic." Madame comes to the 'phone and drinks in the "moosic." When the orchestration stops she pleads, "Oh, that was delicious! Give us some more." It is as good as the opera to the family circle, if there is a telephone in the house, and all for nothing. The telephone company could well afford to offer reduced rates to patrons who connect with Pollman. With a megaphone on the transmitter it is possible to eat dinner to music of the spheres. I wonder that a company has not been organized to furnish this music. The suggestion is made gratis. One great instrument such as Pollman makes, would supply all the melody needed for 1,000 to 100,000 family dinners. Do any capitalists want to join me in the enterprise?

THE INDEPENDENT MOVEMENT IN NEW HAMPSHIRE

THAT Independent telephony is popular in New Hampshire, is shown by the following clipping taken from the Concord Patriot. This unqualified endorsement of the Independent service in what is practically considered the Bell stronghold, is very interesting and encouraging:

The Citizens' Telephone Company, which was incorporated in 1896, has revolutionized the telephone service in this section of New Hampshire by the excellency of the instantaneous communications. Direct communication can be had at any hour of the day or night with many of the towns within the State of New Hampshire. The service to any town with one or two exceptions is free to patrons. The Citizens' Telephone Company is a home industry and not the property of any State, trust or monopoly, and therefore citizens show their public spirit and local pride by patronizing it.

The officers of the company all are men of the highest standing in the community. Dr. Alfred W. Abbott, the president of the company is an exceedingly well known and highly esteemed practicing physician of Laconia; Captain Stephen B. Cole, treasurer of the company, is also treasurer of Belknap county. For many years he was captain of the steamboat "Lady of the Lake," on Lake Winnepesaukee.

Mr. Henry J. Odell, the general manager, is a leading merchant and manufacturer of Lakeport where he has been in business for forty years. He is also president of the Lakeport National bank.

BELL'S ENGLISH PATENTS

The accidental bending of a little spring in a Bell telephone, which prevented the proper working of the delicate machine, gave Mr. Bell the English patents to his invention.

When Mr. Bell patented his invention in the United States, Lord Kelvin was here. He happened to see one of Mr. Bell's machines, and was so struck with it that he took one to England to introduce to his classes. When the instrument was produced it absolutely failed to work, and despite his master mind, Lord Kelvin had to apologize to his classes for his inability to demonstrate with it. Now, the whole failure was entirely due to the fact that a small spring in the instrument had got bent during the journey from America to Scotland. Had Lord Kelvin perceived this and rectified it the instrument would have worked excellently, and the demonstration would have prevented Mr. Bell patenting the instrument in Great Britain.—*New York World*.

HOT TIME ON THE WIRES

A neighborhood telephone system has recently been installed in the town of Norway, S. D., by the Gayville Telephone Company No. 1. Telephones must have been somewhat of a novelty to the inhabitants of Norway, as witness this extract from the Vermillion (S. D.) Plaintalk:

"The Telephone cards were ordered printed, and were delivered to the patrons on Saturday, but in the meantime the people on the line had a jolly good time talking to each other. When the bell rang every one of the sixteen patrons went to the 'phone, and a general all-around long-distance talk was indulged in. The line was kept red hot, and Ole Junker says he got more fun out of it the first evening than the cost of the 'phone."



Financial

ATLANTA, GA.—Otto C. Wolf, of Philadelphia, who was appointed receiver for the Atlanta Standard Telephone Company, in conjunction with C. H. Simmons, of Atlanta, has filed a bond for \$20,000. The National Surety Company, of New York, was given as surety. Mr. Simmons filed his bond as receiver soon after his appointment, and has already assumed charge of the affairs of the company. Mr. Wolf who is to be associated with him, was the former treasurer of the company.

BLOOMINGTON, ILL.—The Home Telephone Company of Bloomington, has increased its capital stock from \$30,000 to \$100,000, and will thoroughly improve its equipment.

CHILLICOTHE, MO.—The State Auditor has sent notices to the County Clerks of each county requiring them to send in a list of telephones, to enable the State Board of Equalization to arrive at the assessment valuation of the telephone lines. This will be the first assessment of telephone property of this state under the new law.

FAIRBURY, NEB.—The capital stock of the Fairbury Telephone Company has been increased from \$10,000 to \$20,000.

OMAHA, NEB.—The County Board of Equalization has assessed the local telephone company \$100,000 as against \$29,125 for last year.

FT. EDWARD, N. Y.—Following are the assessments of telephone companies in this village upon which a special franchise tax must be paid: New Union Telephone Company, \$800, and Hudson River Telephone Company, \$450.

ANTWERP, OHIO.—The Antwerp Telephone Company has increased its capital stock from \$10,000 to \$20,000.

CLEVELAND, O.—The syndicate which had options on 60 per cent. of the stock of the United States Telephone Company has underwritten almost all of the \$1,200,000, or 60 per cent. of the stock. Quite a large amount of stock was taken by independent companies of the state. Stockholders of the Federal Telephone Company and the Cuyahoga Telephone Company, are also interested in the new syndicate. Edward L. Barber, of Wauseon, who is largely interested in telephone properties in New York State, Pennsylvania, Toledo and Lexington, Ky., is one of the prime movers in the new syndicate.

WAPAKONETA, O.—The capital stock of the Wapakoneta Telephone Company has been increased from \$25,000 to \$40,000.

FENNIMORE, WIS.—The Fennimore Mutual Telephone Company has filed an amendment to its articles of incorporation increasing its capital stock from \$1,440 to \$6,400.

RACINE, WIS.—At a meeting of the directors of the Racine Citizens' Telephone Company, a 6 per cent dividend was declared. The company now has 200 subscribers.

New Companies

DOUGLASS, ARIZ.—The Texas and Western Telegraph and Telephone Company has been incorporated with a capital stock of \$200,000; directors: James Douglass, Wm. E. Dodge, Arthur C. James and others. The company will build a line along the El Paso and Southwestern Railway, and build branches later through the southwest, the line at present being planned to extend from El Paso, Texas, to Douglass, with a number of branch lines. The headquarters of the company will be at Douglass.

CASTANA, IA.—The Castana Mutual Telephone Association has been incorporated, and will install a telephone system here.

DENISON, IA.—The Crawford County Telephone Company has been incorporated with these officers: J. B. Romans, president, and J. F. Glenn, secretary.

GUTHRIE CENTER, IA.—The Guthrie Center Mutual Telephone Company has been organized with these officers: President, W. T. Conner; secretary, A. Lant.

LESLIE, IA.—The Leslie Telephone Company has been organized with a capital stock of \$800.

LOST NATION, IA.—The Lost Nation Telephone Company has been incorporated with a capital stock of \$5,000.

MILTON, IA.—A telephone company has been organized north of town, with the following officers: President, Roy Campbell; vice-president, Emery

Bell; secretary, Oliver Leaverton; treasurer, F. M. Robinson. The line will run from here to Keosauqua.

MUSCATINE, IA.—The Bluff Road Telephone Company of this place, has been incorporated with a capital stock of \$1,000.

MASON CITY, ILL.—The Mason City Mutual Telephone Company has been organized.

BRICK CHAPEL, IND.—The Brick Chapel Telephone Company, of Putnam County, has been organized with a capital stock of \$450.

PIERCETON, IND.—The Pierceton Telephone Company, with a capital stock of \$20,000 has been incorporated. The directors are John T. Brosnahan, D. W. Strauss, Harry Humrichouser and W. L. Humrichouser.

Le Sueur, Minn.—The Farmer's and Merchants' Mutual Telephone Company has been incorporated with a capital stock of \$30,000.

WALNUT GROVE, MINN.—A telephone company has been organized here with the following officers: President, H. O. Garlock; vice-president, F. F. Goff; secretary, Geo. Long, and treasurer, R. R. Freeman.

PONY, MONT.—Henry J. Schreiner, Blazet Tinsley and others, have incorporated the Citizen's Telephone Company of Pony, with a capital stock of \$3,000.

CAZENOVIA, N. Y.—The Cazenovia Telephone Company, of Cazenovia, has been incorporated with a capital stock of \$1,000. Directors, Henry Burden, Jr., J. A. Loyster and M. R. Joy, of Cazenovia.

GAYHEAD, N. Y.—Arrangements are being made for a telephone line connecting Gayhead, Stormville, Fishkill Plains, Hopewell Junction and Green Haven. The officers of the company are: President, Dr. D. H. White; vice-president, John Rapelje; treasurer, C. M. Smalley; secretary, Stephen White; directors, Dr. H. D. White, John Rapelje, Charles Underhill, D. R. Robinson, C. M. Smalley, Ralph Horton and Jarvis S. Phillips.

BERGHOLTZ, OHIO.—The Bergholtz Telephone Company has been incorporated with a capital stock of \$5,000 by Lewis Stemnetz and others.

WILKESBARRE, PA.—An effort is being made to organize a company in Sugarloaf, Butler and Black Creek Townships, to supply farmers with telephones. Hazleton and Wilkesbarre capitalists are back of the movement.

EUREKA, TEX.—The Eureka Telephone Company, of Eureka, Navarro County, has been incorporated with a capital stock of \$4,000, by J. A. Bonner, J. R. McCormick, R. G. Goree, T. R. Harwell and C. J. McConinco.

CLAREMONT, VA.—Articles of incorporation have been filed by the Claremont Telephone Company, to build and operate a telephone line from Claremont to Surry Court-house, to Waverly and to Petersburg. Capital stock, \$1,000 to \$5,000. George H. Woods, president; H. J. Arrington, secretary-treasurer.

DELRAY, W. VA.—The North River Telephone Company, of Delray, has been incorporated to build and operate a telephone line along North River, from Rio to Hanging Rock. Capital stock \$500, of which amount \$205 has been subscribed and \$150 has been paid. Incorporators: I. R. Marvey and J. W. McDonald, of Delray, A. A. Shuller, of Sedan; I. N. Baker, Israel Maphis, Nathaniel Maphis, R. L. Hund, E. T. Byrd, R. Lee Fry and W. H. Gardner, of Rio.

RAVENSWOOD, W. VA.—The Ravenswood Telephone Company has been organized and steps will be taken to install telephones.

ARCADIA, WIS.—The Western Telephone Company which was organized some time ago with a capital stock of \$35,000, will operate throughout Tresnepealeu, Buffalo and Jackson counties, and will install exchanges at Arcadia, Centerville, Galesville, Blair, Independence and Whitehall.

Elections

OAKLAND, CAL.—The Independent Telephone and Telegraph Company, recently organized in this city, has elected Antonio McMillan president, A. J. Snyder secretary, and F. J. Woodward treasurer. Applications for franchises in Oakland, Alameda, Berkeley, and throughout Alameda County will be made immediately. An expert for the company is now in Los Angeles investigating the plant that is being installed for the new Home Telephone Company of that city, with a view to inaugurating the same system here. The directors of the Independent Telephone and Telegraph Company are as follows: Antonio McMillan, John C. Hampton,

THE WEEK'S MESSAGES Continued.

Senator E. K. Taylor, H. C. Stillwell, A. P. Holland, A. J. Snyder, R. B. Mott, F. C. Watson and F. J. Woodward.

MADRID, IA.—The following officers were elected for the Garden Township Telephone Company at a recent meeting: President, T. R. Dresser; vice-president, Joe Kenison; secretary and general manager, F. A. Anderson.

BEAVER DAMS, N. Y.—At the first meeting of the Schuyler County Telephone Association held here, the following officers were elected: President, S. B. Cole; vice-presidents, F. L. Northrup and Dr. R. Bell; secretary, W. T. Macreery; treasurer, S. E. Johnson.

EAST BRANCH, N. Y.—The following officers have been elected for the East Branch Telephone Company: Superintendent, E. V. Merritt; president, Geo. W. Holmes; secretary and treasurer, C. J. Holmes.

YATES, N. Y.—At a recent meeting of the Barrington and Crosby Telephone Company, the following directors were elected for the ensuing year: Isaac Crosby, Amos P. Wortman, Samuel I. Thayer, Herbert D. Ovenshire, Howard Fullager, F. W. Windnagle, Charles E. Guile. At the close of the election of directors, the following officers were elected: President, Charles E. Guile; vice-president, Howard Fullager; secretary and treasurer, Herbert D. Ovenshire. The company is capitalized at \$5,000, there being 100 shares at a par value of \$50 per share. Thirty-four shares have already been taken, which will assure the completion of the line at an early date. Various committees were appointed on right of way, construction, etc.

CAMBRIDGE, O.—At a meeting of the stockholders of the Home Telephone Company, the following directors and officers were elected: Directors, J. M. McKittrick, Wm. Hoyle, C. C. Cosgrove, D. M. Hawthorne, M. L. Hartley, T. W. Scott and H. P. Woodworth. Officers, J. M. McKittrick, president; Wm. Hoyle, secretary and treasurer.

Franchises

POMONA, CAL.—Only one bid was made for the telephone franchise offered for sale by the city. D. S. Parker, representing the Pomona Valley Telephone Company offered \$85, which was accepted.

SANFORD, FLA.—The city authorities have granted the Sanford Telephone Company a thirty years' franchise. At a recent meeting of the stockholders, C. R. Walker was elected president of the company; W. H. Mitchell, vice-president; W. B. Mitchell, secretary and treasurer. J. F. Miller and W. W. Long, together with the officers given above were chosen as directors. The company starts with a capital of \$2,500. Upon the completion of the exchange, the company will build on to Orlando, with exchanges at Maitland and Winter Park.

SIOUX CITY, IA.—William Bowen, agent for an Independent telephone concern, has been looking over the ground relative to the outlook for the establishment of an Independent exchange here. The plan of Mr. Bowen's company is to secure a telephone franchise and then to get capitalists interested in the project to advance funds necessary to construct the exchange. The company claims to have established exchanges in Ottumwa, Davenport, Portland, Louisville and many other cities.

SOUTH BEND, IND.—An ordinance has been submitted recommending that the Home Telephone Company be granted a franchise for 37 years, instead of for 50 years as asked by the company. There were other important changes and amendments. The report was tabled for two weeks to give the new council an opportunity to study the original franchise.

NORTH ADAMS, MASS.—One of the local members of the Berkshire Telegraph and Telephone Company says the idea that the company's schemes are dead is an error, and that while the company has not been able to accomplish much so far, the project will be revived in the near future, and another effort made to secure franchises in North Adams, Pittsfield and other places in the county.

STILLWATER, MINN.—Arthur C. Bowe, of Minneapolis, representing the Consolidated Telephone and Telegraph Company, has requested permission to erect telephone poles within the city limits. The city council only a short time ago refused another Independent company a franchise.

The Consolidated company has four lines extending from St. Paul and Minneapolis, Duluth and West Superior, and connecting with villages and towns along the Northern Pacific and Eastern Minnesota railroads. It also has 7,000 connections in St. Paul and Minneapolis, and a line to Lakeland, Mayville and Afton in Washington County, and proposes to connect with Cottage Grove, Valley Creek, Hudson, Hastings and other points in this vicinity.

BEATRICE, NEB.—An ordinance has been introduced in the city council, granting a telephone franchise to the Montague Bond and Investment Company of Kansas City. The company already has a franchise, but wants a few alterations made. "The plant at Beatrice," said R. V. Montague, recently, "will be built as soon as the franchise is granted. Lines will be extended into the surrounding country as soon as the business justifies the expense. Our company already owns plants in Winfield, Kas., and Mexico, Mo., the latter being a recent purchase. We also have a number of toll lines in Kansas City's commercial territory."

HAMILTON, N. Y.—Robert Neill, of Peterboro, representing an auto-

matic telephone company, is the third party after the telephone franchise in Hamilton.

YANKTON, S. D.—The Yankton Telephone Company has been granted a 20 year franchise.

MOUNDSVILLE, W. VA.—The National Telephone Company, of Wheeling, has filed with the city clerk of Moundsville, an application for a franchise.

Underground

MOLINE, ILL.—The new Independent telephone company has begun to lay conduits for the wires of its new plant, and has 30 or 40 men at work. All wires in the fire limits will be underground, and it is expected the underground work will extend to many districts outside of the fire limits. The Iowa Telephone Company in this city has begun a strict enforcement of the rule that has been ignored so long in regard to calling by number. It is claimed that an observance of this rule by the public will tend to better the service.

Competition

GREENWOOD, S. C.—At a meeting of the city council a petition from the Bell Telephone Company was presented, asking the privilege of entering the town for the purpose of establishing a telephone exchange. The Bell Company is surveying a line from Clinton to Abbeville, and, although a straight line between these two places would throw them above Greenwood, yet they are willing to bend a little if they can do any business here. Because of the franchise now held by the local telephone company, which the council desires to respect, the Bell Company's request was denied.

Combinations

CENTERVILLE, IA.—W. C. Stickney, cashier of the First National Bank, has purchased the local telephone exchange from S. G. Bucher.

MARSHALL, ILL.—The Wabash Telephone Company is a new corporation formed by the consolidation of the Marshall, Paris, Chrisman and Western Union telephone lines. H. H. Knipe, of this city, is the promoter and president of the corporation. Bonds to the amount of \$125,000 have been floated. The headquarters will be located here.

MANKATO, MINN.—In our issue of June 21, it was stated that A. W. Colvin had purchased the local telephone exchanges at Mankato, Blue Earth City, Elmore, Winnebago City and other adjoining towns. Dr. J. H. James, president of the Mankato Citizens' Telephone Company, has written a letter stating that his company has not been sold, and that, on the contrary, they are rebuilding their exchange, with the latest central energy system.

BALTIMORE, MD.—The articles of consolidation of the Maryland Telephone Company of Baltimore, the Western Maryland Telephone Company of Carroll County, and the Boyds Telephone Company of Montgomery County, have been filed here. The name of the new company formed by the consolidation will be the Cumberland Valley Telephone Company of Baltimore City. The company will have an authorized capital of \$200,000, divided into 2,000 shares of \$100 each. The officers of the new company for the first year are as follows: President John Hinkley, Baltimore; vice-president, William D. Barnard, St. Davids, Pa.; secretary, Geo. W. Leonard, Baltimore; treasurer, Samuel R. Caldwell, Philadelphia. The directors are the officers, and Thomas Foley Hiskey, Baltimore; Louis J. Burger, Baltimore; Howard E. Bokman, Baltimore; Ward R. Bliss, Chester, Pa.; Charles M. Clement, Sunbury, Pa., and Thos. J. O'Neill, Hanover, Pa. The shares of the new company will be distributed among the stockholders of the three old companies according to their holdings.

Construction

DAVENPORT, IA.—The new telephone company has contracted for 2,127 telephone poles, which will be used in the work in this city.

PEORIA, ILL.—The new telephone company has posted a forfeit of \$20,000 for the construction of its lines. Work will be commenced immediately.

INDIANAPOLIS, IND.—It is proposed to connect the lines of the New Telephone Company with those of the company operating in Shoals, Loogootee, Washington, Princeton, Bedford and other cities in the southern part of the state, so that they may have connection with other Independent lines throughout the state. A meeting was held the other day in the office of S. P. Sheerin, president of the New Company, at which Gilbert H. Hendron and John F. Sinkard, of Bloomfield, D. A. Yoder, superintendent of the Vincennes and Washington companies, J. G. H. Klinger and M. J. Murphy, of Brazil, Guy Bush, of Clay City, and Z. P. W. East of Worthington, conferred with the officers of the New Company on the proposition. A new line will also be built from Lanton and Jasonville to Terre Haute. It will be nearly forty miles long, and will connect a part of the Indiana coal field that is now on a great boom. A number of big coal companies are sinking shafts about Jasonville and in other parts of Gréene County that will be reached by the new system.

ELIZABETHTOWN, KY.—The Home Telephone Company, of Louisville, will soon give Elizabethtown another connection with Louisville and

THE WEEK'S MESSAGES Continued

other points. About seventy-five hands are at work putting up poles and stringing the wire between here and Stithton. It is understood that an agreement has been reached by which the Home enters the county exchange, and that the county company is to have twenty-five per cent. of the toll business.

HARTFORD, KY.—G. O. Bracht, of the Independent Long Distance Telephone Company, is rebuilding the Rough River Telephone system and putting it in the very best of condition. A new switchboard will be put in of double the former capacity. Direct connection will also be made with Louisville.

HOLLY, MICH.—The Alma and Oakland County Telephone Companies have completed arrangements for uniting their lines at Holly. The work of accomplishing this will be completed soon, and service will be given to all points of Michigan with the exception of Detroit, Ann Arbor, Ypsilanti and Mt. Clemens.

MEXICO, MO.—Gus T. Graham, late manager of the Mexico Telephone Company, which has been sold to Kansas City parties, although still in charge of the local plant, will begin the construction of a number of exchanges in northwestern Missouri about August 1.

FREMONT, NEB.—The organizers of the new Independent telephone company at a recent meeting, decided to connect their lines with the Farmer's telephone system of Dodge County. Connections are also to be made with Wahoo, Cedar Bluffs, Arlington and many other towns with Independent exchanges.

BATAVIA, N. Y.—The line of the Home Telephone Company of this place, will be extended to Oakfield.

CONTOOCOCK, N. H.—A new telephone line is being constructed to connect with the local system of this place, which will include several subscribers from the farming community.

MARILLA, N. Y.—A telephone line is being put up from Attica to this place by a stock company.

NEWARK, OHIO.—The Newark Independent Telephone Company is rushing its plans for the complete reconstruction of its system in this city and county. It will install a "central energy" plant. The company has just secured the services of Mr. Charles E. Hollander to act as manager succeeding Mr. Charles E. Stasel, who some time ago consented to act as temporary manager until a man could be selected.

BIRDSBORO, PA.—A project is on foot to establish a telephone line between Birdsboro and Elverson.

ORD, PA.—The telephone line from Ord to Deckers Point, has been extended from Ord to Hooverhurst by way of Gipsy. A number of influential men of Glen Campbell are expected to extend the line to that place.

GARRETSON, S. D.—The Enterprise Telephone Company is installing a system of about forty telephones here.

MEMPHIS, TENN.—C. F. Anett, assistant superintendent of telegraph of the Illinois Central Railroad, is making a tour of the Illinois Central system, inspecting portions of the road's new long-distance telephone line, now under construction, to connect Chicago with New Orleans. The work north of Memphis is practically completed, and there remains not a great deal yet to be done between Memphis and New Orleans. The line is already in use south of Memphis to Grenada, and has been completed almost to that point north from New Orleans. It is expected that the entire line from Chicago to New Orleans will be in operation this month.

SUPERIOR, WIS.—The People's Telephone Company has been working on a new line to West Duluth, the purpose of which is to give this city more direct long distance connections with Minneapolis and other cities in that direction.

Miscellaneous

LARCHWOOD, IA.—Larchwood will soon have a telephone exchange.

PILOT MOUND, IA.—Several of the business men and a number of farmers here are in favor of a local mutual telephone line, in preference to supporting the Dayton Telephone Company which has promised to put in a switchboard here if a certain number of telephones are put in.

ORLANDO, FLA.—The telephone line between Orlando, Apopka and Clay Springs has been completed.

BOSTON, MASS.—The instrument statement of the American Telephone and Telegraph Company for the month of June, and also since December 20, shows as follows:

June	1902.	1901.	1900.
Gross output.....	96,653	96,300	55,613
Returned	41,741	34,221	25,671
Net output.....	54,912	62,079	29,942
Since Dec. 20, 1901:			
	1902.	1901.	1900.
Gross output.....	589,109	469,923	346,146
Returned	226,267	194,569	132,660
Net output.....	362,842	275,354	213,486
Total outstanding.....	2,888,854	2,228,170	1,793,991

BRUNSWICK, ME.—The citizens of Harpswell are indignant because of the failure of the New England Telephone Company in completing the line projected a year ago to connect that town with Brunswick. This line was partially constructed last year by Brunswick people, who afterward sold their interest to the present owners. A permit was granted the New England company to stretch its wires, but some dissatisfaction was found in the permit by the officers of the company and work ceased.

HILLSDALE, MICH.—The Farmer's Independent Telephone Company, which already has lines connecting Jefferson, Waldron, Ransom, Prattsville, Pittsford and other neighboring towns, is coming into Hillsdale. The plan of operation for the farmers is very reasonable. Twenty-five dollars entrance fee is assessed and then an annual fee of one dollar is made. They also have the privilege of furnishing one half mile of poles, being allowed forty cents per pole.

FREMONT, NEB.—The telephone line has been completed from Fremont to Fontanelle. It is expected that the line will be extended to Talbasta, five miles beyond Fontanelle, as soon as the work can be done.

STROMBURG, NEB.—The telephone system being constructed by the Golden Rod Company is rapidly nearing completion. The company will have charge of several rural lines, as well as the city exchange, and will enter into competition with the Bell people.

BRIDGEBORO, N. J.—Local residents have applied for an extension of the county telephone line to this place.

JAMESTOWN, N. Y.—The Home Telephone Company, which is nearly ready to begin operations in Jamestown, has finished negotiations with the Consolidated Telephone Company of Buffalo, to handle its long-distance business.

KNOXBORO, N. Y.—Knoxboro is to have connection with the Rome Home Telephone Company.

SALEM, O.—The Columbiana County Telephone Company now has connection with the local telephone exchange at North Georgetown. This arrangement will give service between Salem and North Georgetown.

MADISONVILLE, TEX.—L. H. Fuller, of Calvert, is endeavoring to have a telephone system installed here.

NO POLICE TELEPHONES IN ENGLAND

WHEN the Spectator was planning his first visit to Scotland, an astute traveler advised him to hunt up a town there called Edinburgh. This same taste for untrodden byways led him in a recent sojourn in England to visit a quaint old village on the banks of the Thames called London. About a year ago a gentleman residing there, finding that burglars had visited his house, rushed to his telephone to communicate with the police. Imagine his consternation on learning that there was no telephone in the police station. As the idea of using the telephone would never have occurred to a Londoner at home, this gentleman must have been a foreigner. The Spectator presumes he then found on inquiry that the correct thing to do under the circumstances was to despatch his butler to the station in a hansom, a good old custom dating from the reign of Queen Anne. At the time of the search for the Liverpool bank robber, Goudie, the police were much hampered by the fact that the Scotland Yard service was not equipped with the telephone. These astonishing conditions prevail in London to-day, the local police stations having no telephone connection whatever, either with one another or the public.

To one coming from the whirl of a metropolis to this village, the almost entire absence of the twitter of the telephone bell is, on the whole, rather soothing. Although it may be heard in the largest business or theatre offices, it does not whirl here, there, and everywhere, as it does even in small Western frontier towns in the United States. In private houses it is almost unknown, and to make an appointment with a friend means, as of old, a day or two for interchange of notes. The new woman, who does her marketing with various market stalls over the telephone under the shelter of her own hall or at her library desk, has not yet been invented in the village of London. Perhaps, had the enterprise to introduce this convenient invention been waning among the villagers themselves, the crowd of American electricians at present working in London would have made some headway, but for the fact that a political obstacle blocks the way in the shape of an unreconciled conflict between government and private interests.—*The Outlook.*

TRADE NOTES

A TELEPHONE TIME CLOCK

A UNIQUE "telephone time clock" is advertised in this issue of THE AMERICAN TELEPHONE JOURNAL. The owner of the American patent rights, desiring to sell his rights for the manufacture of the instrument in this country, would be glad to hear from prospective buyers by addressing "Time Clock," care AMERICAN TELEPHONE JOURNAL. The inventor of the clock, Mr. H. Keim, of Germany, has made a fortune, his company having manufactured and sold over 375,000 of the clocks.

The operation of the clock is extremely simple. It notifies the patron of long distance lines when his time is consumed. There is a three-minute dial and one for five minutes. When a patron, for instance, desires to talk five minutes, he sets the switch on the five-minute dial, and then pulls the cord hanging from the clock. This automatically sets the clock, so that the bell on top will ring at just 15 seconds before the five minutes are consumed.

It is obvious that this will be a great convenience both for patrons and long distance companies. The user on commencing conversation sets the clock, and he is automatically notified of the time he has consumed. When settling his bill, a glance at the clock will show him that the operator is not charging for more time than he used.

THE STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY is installing a new 1,000 line switchboard for the Whiteside County Telephone Company. A. K. Stephenson of the Stromberg-Carlson electrical department is superintending the installation, which will require about three weeks' time. The Whiteside Company has already about 300 subscribers' instruments put in, leaving about 700 connections for future growth.

THE KELLOGG SWITCHBOARD AND SUPPLY COMPANY, Chicago, has received an order from the Frontier Telephone Company of Buffalo, for 6,000 telephones complete, to be installed in the company's system at Buffalo.

Before this order was placed, exhaustive tests were made, and a competitive test was held at Scranton, Pa., conducted by Wilbur H. Johnston, chief engineer of the Frontier Telephone Company. The test was made over 400 miles of long distance telephone lines, and the Kellogg apparatus was so satisfactory as to warrant the above order.

The Kellogg transmitters have been tested on lines up to 1,500 miles, and found to be perfectly satisfactory, and superior to the "Bell Solid Back."

THE CENTURY TELEPHONE CONSTRUCTION COMPANY which is a part of the CONSOLIDATED TELEPHONE COMPANY, Buffalo, has moved its plant from Cleveland to the Tift Building in Buffalo, where it will utilize ten thousand square feet of floor space. It will employ about one hundred men in installing Independent telephone long distance lines.

MR. A. S. DEVEAU, president of the DEVEAU TELEPHONE MANUFACTURING COMPANY, has a fully equipped plant at 27 Rose street, New York, and is prepared to attend to all orders for telephone apparatus. On August 15, a handsome catalogue will be issued by the De Veau Company, showing the advantages of the following apparatus, all of which is manufactured in its plant. Long distance telephones, interior telephones, patented automatic switchless telephones, patented flush telephones, restoring and non-restoring switchboards, intercommunicating telephones, central energy telephones and switchboards, and patented all metal intercommunicating and hotel telephones. The company is also prepared to book orders for line construction and general electrical supplies.

Mr. DeVeau has severed his business connection with Stanley & Patterson at 93 Liberty street, and will devote his entire attention to the manufacture of the DeVeau standard telephone apparatus.

THE AMERICAN ELECTRIC TELEPHONE COMPANY, Chicago, has just received an order for equipment from the Jackson Home Telephone Company, Jackson, Tenn. The contract calls for a switchboard of the latest improved, long line and supervisory for an exchange of 2,000 lines, together with a complete power equipment, and latest improved type of telephones.

THE CHICAGO, MILWAUKEE & ST. PAUL RAILWAY now owns and operates about 6,000 miles of road in Illinois, Wisconsin, Iowa, Minnesota, South Dakota, North Dakota, Missouri and Michigan. All cars operated by this road—sleeping, parlor and dining included—are owned by it. It uses the block system of signals, all trains are lighted by electricity and everything is done for the safety and convenience of patrons. The Pioneer Limited trains between Chicago, St. Paul and Minneapolis are said to carry the costliest sleeping cars in the world and also the best dining car service. General Passenger Agent F. A. Miller, Chicago, will furnish any information on application concerning time tables, maps, etc.

PERSONAL NOTE.

Mr. Fred L. Martin, the popular and capable advertising manager of the Kellogg Switchboard & Supply Company, Chicago, married on June 17 Miss Lillian May Kane, daughter of Capt. John W. Kane, of Bluehill, Me., the ceremony taking place in Blue Hill. About three hundred friends of the couple assembled in the church to extend best wishes. After the ceremony, Mr. and Mrs. Martin were driven from Bluehill to Ellsworth and on Wednesday went to Hancock Point to spend several weeks at the Tarratine House. Later they will make their home in Chicago, where Mr. Martin is so well known.

YOUNGEST OF HELLO GIRLS

A wool dealer of South Front street went to the telephone the other day in answer to a call and heard these words: "Hello! This is Dr. Blank. Are you Mr. Smith?" "Yes," the wool man replied, "I am Mr. Smith. What can I do for you, doctor?" "Why, Mr. Smith," said the physician, "I want to announce to you that you are the happy father of a little daughter, and that everything is doing well." "Hurray! I'm glad," Mr. Smith said, in a moved voice. Then the doctor proceeded: "Your daughter wishes to speak to you. Hold your ear there while I lift her up." Mr. Smith held his ear there and heard with strange emotion the inarticulate complaining voice of the little daughter whom he had not yet seen.—*Philadelphia Record*.

PLANTS FOR SALE

TELEPHONE PLANT FOR SALE—160 telephones, 100 miles of toll lines; excellent opportunity for extending business; will sell for \$12,000; pays 15 per cent. net on this amount. Address TELEPHONE CO., care of AMERICAN TELEPHONE JOURNAL.

WANTED

POSITION with Electrical or Telephone Manufacturing Company, by an expert battery-maker Twenty-two years old; good references furnished. THOS. A. LOUGHRAN, JR., 28 Romaine Avenue, Jersey City, N. J.

WANTED.—Position as wire chief or manager of an exchange of 1,500 or 2,000 subscribers in a clean Western town or city by a married man of temperate habits, with twelve years experience with the Bell Co., but now taking care of an exchange district with 1,500 subscribers for an Independent Co. Can give good references. Address L. M., AMERICAN TELEPHONE JOURNAL.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISSELL CO., Toledo, Ohio.

A FEW more men wanted to take advantage of our gilt-edged offer: 5,000 Toll Tickets printed, \$1.75. Independent Telephone Printers: THE SUN-PRESS, Stockbridge, Mich.

The American Telephone Journal

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SIMPLE APPARATUS FOR TELEPHONE TESTING

By E. D. CRACRAFT

THE subject of testing has often been well described, and many useful ideas as well as much valuable information along this line fill pages of current electrical literature. Yet in nearly all these articles it is taken for granted that one is supplied with the many instruments, such as Wheatstone bridge, voltmeter, ammeter, etc., with which to make the tests elaborated upon. Now, as a matter of fact, electrical instruments are not given away with baking powder, nor are they to be bought at bargain sales at the department stores, but usually they are "one price," and that a stiff one. Moreover, if one finds a "just as good" or "ours is better," for a little less money, he is likely to be woefully disappointed at the results he obtains compared to duplicate tests made with standard instruments. The cost, then, of high-grade apparatus has led companies using these testing instruments to be most economical in their supply, so that many of the men who would make the best use of them are left without most or all of them. This deficiency, in its turn, has developed latent ingenuity on the part of many telephone men that is well worth recording. To describe some convenient apparatus, made from scraps with a little new material, and to arouse others to tell of their schemes and successes are the objects of this article.

Our only instrument being a voltmeter, will not carry us very far in a complicated case of trouble. The inadequacy will be better realized when it is known that our switch-board is a 3,700-line lamp signal, multiple board and that we have incoming and outgoing trunks to two branch exchanges, a set of incoming and outgoing trunks between two cities, with apparatus necessary to overcome the disturbances due to the lighting and power systems of the two cities, the street railway and the telegraph lines which run parallel with them. Then there is the toll board with its connecting switch, whose circuit requires the use of five relays, to which three at the toll

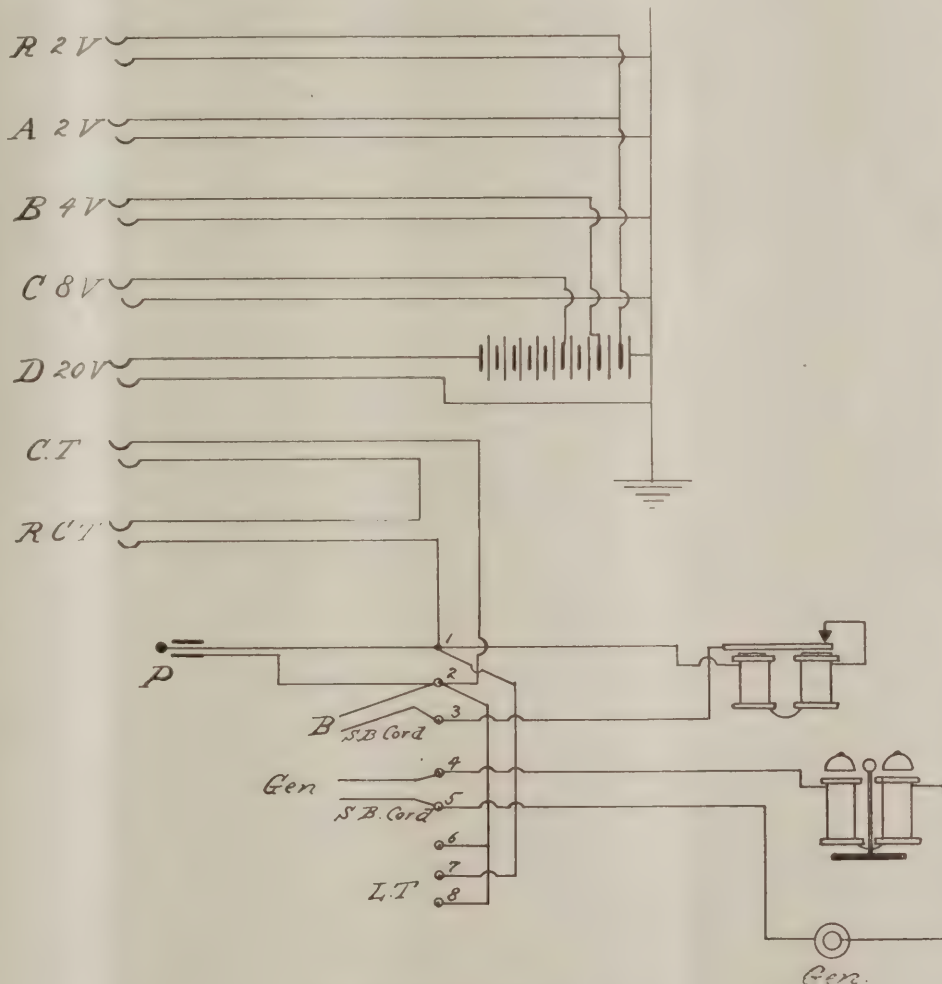
board proper may be added. Let me repeat, these elements necessitate circuits on which trouble cannot always be located with a voltmeter. Consequently it has been necessary for us to build a set of testing apparatus to meet, or to assist us in meeting, our difficulties.

As the majority of cases of trouble consist of crosses, "shorts," "opens," and grounds, we have simply enlarged the sphere of the buzzer with its accompanying battery. With a broken strip of jacks, a buzzer kindly forgotten or mislaid by some of the installers, three cords that had done service in the board and were retired, two receiver jacks which had been replaced by more modern ones, a 1,000-ohm bell and some good wire, we set to work. The result was the apparatus which will be now described.

At A, B, C, D, as shown in the drawing, the battery of different voltages may be connected to the buzzer or the lamp springs L T or the cord jack C T. The 1,000-ohm bell is connected in series with one side of the generator and the two ends are left free, so that with a cord attached one can reach to any convenient place where he may wish to make a test. The whole apparatus is fastened to the lower side of the work bench where it is handy for use at any time. From this point one or two pairs of simplex wires are run to the intermediate or cross-connecting rack where slack enough is coiled up to reach any line in the exchange.

Now we are

ready for testing. The first jack, R, is for receiver testing and has two volts connected directly to it. By working the plug into and out of the jack, thus making and breaking the current, one can make a very good estimate of the condition of the receiver. Then, making a complete contact and working the cord, a scrape or cut-out will make itself known at once. Where plugs are not used on operators' receiver cords, or where one wishes to test subscriber's receiver cords, binding posts can be substituted for the jack R. R C T is also a receiver jack which can be sub-



MR. CRACRAFT'S TESTING OUTFIT.

stituted by binding posts. It is connected in series, as will be seen, with *C T*, which is a line jack for testing doubtful switching cords before putting them into the board. To test a cord, plug into this jack, short-circuit the conductors, then put plug *P* into the jack whose voltage corresponds to that of the cord circuit and listen while you work and twist the cord throughout its whole length. If a cut-out or scrape is to be found you will locate it very shortly.

The springs marked *L T* are for testing line and pilot lamps and are connected to the battery through the plug *P*. This will be found a boon to those who have lamps of four different voltages in their boards, as we have here.

By allowing some slack at the buzzer terminals 2 and 3, which we made by attaching an old switching cord with its conductors skinned for about two inches and wrapped with No. 22 wire, a handy test for many kinds of opens, crosses, etc., can be made, while by practice a reasonably good test of the resistance of coils can be done by comparing them with coils of a known resistance. For this the various voltages obtained by placing plug *P* in the jacks *A*, *B*, *C* and *D* will be necessary.

We use the generator more particularly for testing drops or plugs for short, or open circuits or grounds. For if 75 volts alternating current will not ring the bell through a suspected cross or short circuit, one can be very sure the battery current will not pass through, and if it will not ring through a suspected open circuit there is little doubt left concerning the condition.

There is no place where accuracy of location is more necessary than in the switchboard. This requires the greatest amount of thought and study of any branch of testing. It has been much neglected in the past, partly due to the fact that those who hold official positions do not understand the complicated circuits of a modern board, and partly due to the ability engineers have shown in making boards and circuits that have worked with only half a chance wherever they have been installed. The growth of exchanges has been so rapid that the switchboard of to-day is a marvel of mechanical and electrical progress. The height of attainment in telephony is no longer the ability to climb a pole or string a circuit. The telephone man of to-day cannot always go down the street with his nose in the air and locate the reason a subscriber cannot get central or the cause of a roar which makes conversation impossible. The engineer has met every emergency and left behind him an agent to overcome each in its place. The operating force must make the acquaintance of these agents, their defects and advantages, and in this guesswork is the last resort.

One of the most important places for accurate work is in the multiple jacks. The damage to the looks and efficiency of the board done by pulling out or working at the wrong jack or strip of jacks may be far greater than the case of trouble sought for. Much trouble here is caused by such insignificant things as pencil points, broken bushings, tiny screws from the plugs, bent jack-springs, etc. Yet any one of these may put the busiest line out of service. But removing the wrong jack strip may throw half a dozen or more lines out of order.

It is here that our friend the buzzer, with its changeable battery, is most useful and exact. We have had it in operation for about nine months now and have never yet missed the location of a case of switchboard trouble, although our average is nearly a trouble each day.

Our scheme for locating disturbances is as follows: Disconnect the multiple and line cable wire at the rack, attach the lead wires from the workbench to the multiple wires and attach the buzzer to the leads. By means of the plug it is easy to change the voltage to higher or lower according to the resistance of the defect. Now proceed, with a hand or head receiver, wired to suit the case, to listen at each section of the board. As soon as you plug into the jack in trouble the buzzer will stop and only a click will be heard between this point and the first section, while beyond this point no sound will be heard at all. Let us take examples of two kinds of multiple trouble. The wire chief tells us there is a ground on the ring of 365 in the board. After a little preliminary examination we find that the sleeve of line 384 is bent up so as to make contact with the ring of 365; this grounds the battery through the line relay, bringing in its signal, also causing current to flow through cut-off relay 384 and opening its signaling circuit so that neither subscriber can get central. We remove the multiple and line wires of 365 and the sleeve of 384 and connect the simplex pair. Now with the buzzer attached we find the buzzer will operate on say four volts, where we leave it going. Now, taking a receiver, we attach two switching cords so that the sleeve of one and the ring of the other complete the circuit through the receiver. Listening

in at the first position we hear the buzzer, so we pass to the second and on, until at, say the eleventh section, the buzzer suddenly stops as we work our plug. Here, then, is the trouble, and when we pry the multiple cable up and bend the offending spring down into place the line tests O. K.

Or, suppose a short-circuit suddenly appears on 1,269. This time we remove the line and multiple wires at the rack and attach the simplex to the tip and ring of the multiple. Here, possibly, we must put 20 volts on the buzzer before it will respond. Now it is only necessary to put one switching cord on the receiver and this with its tip and ring to complete the circuit. Proceeding as before, we locate this on the fifteenth section, but a strange action in the jacks tells us that the trouble is caused by a movable object, and upon looking closely into the jack we discover a little screw. With some kind of a hook we fish the screw out without removing the jack, thus avoiding the risk of greater damage.

The advantages of being able to fit any common cross or ground and to change the voltage to operate through various resistances may now be fully realized. The saving of time is a gain to the switch-board man and better than "Celery Compound" to the nerves of the subscriber, while accuracy of location is a boon to all.

Most of these applications have been fitted to large exchanges, but those who have small boards will be able to take advantage of all uses except in cases of multiple work. And it will be found a source of great satisfaction as well as a gain of knowledge to find out what causes your troubles without waiting for an expert. Take, for example, an unbalanced repeater. It does not work, and as you have no instrument to test out you leave it for a month or two until some one comes out and tells you that one coil is short circuited. If you had taken that repeater out and tested each coil with the buzzer you would have known from the volume of sound that one coil was of very low resistance compared to the others. Then you could have replaced it and saved time, even though you had to order a new one from the manufacturer. This was the case in some chronic cord trouble we recently had been vexed with. The repeater was made of four coils and one became defective. When we tested the coils out we located the trouble, renewed the repeaters, and the cords that have worked well ever since.

This is but an example from many, but it illustrates the convenience of handy apparatus, which will be appreciated by any who have no regular outfit of testing instruments. And, it may be that some of the attendants of the 4,311 exchanges in the United States will be benefited by these suggestions, while there may be many who have better schemes. If the latter will take up their pens and speak through the TELEPHONE JOURNAL they can produce some valuable literature for telephonists.

Those who keep the books, who solicit the subscribers, and who do the business of the company are free with advice and information, even at times telling how the technical side ought to be run, while the technical men are for the most part silent. The former advertise the company and themselves, and often draw good salaries for short hours and little thought or labor. There are many among the latter with whom I am acquainted, who really keep their respective companies in operation, yet are almost unknown, and visitors in the exchanges are surprised to know that there is apparatus which requires any care at all. As stated above, one purpose of this article is to inspire others to write of their plans and successes, and it is my earnest hope that this effect may be soon realized.

TELEPHONES IN STREET RAILWAY OPERATION

THE telephone as an aid to the operation of railway systems, both steam and electric, is daily obtaining wider recognition. There is undoubtedly a great field here for telephone engineers and manufacturers, and those who first organize systematic methods of invading it and of catering to the needs of street and steam railroads will surely reap a rich harvest within the near future. We read in the daily papers that the Berkshire Street Railway Company, operating in Pittsfield, Mass., has made a contract with the New England Telephone Company for the installation of a system of twenty-six telephone stations to provide communication between the power-house, car-sheds, substations and each of the various switches along the line. The People's Tramway Company, of Danielson, Conn., is installing a telephone system which will give communication not only between the different departments, power-house, car-shed, offices, etc., but will enable every car to get in communication with headquarters from any part of the line. Each car will be equipped with a portable telephone set and a pole contact for tapping the line.

SOME TELEPHONE REMINISCENCES—III.

By HERBERT LAWS WEBB

OCCASIONALLY we turned our attention from telephones to electric bells, and once or twice to electric lighting.

Electric bells were not very profitable, however, and involved too much work in proportion to the possible net return. One job that gave us a heap of trouble and very little net return was an electric bell installation in a hotel at Puerto Santa Maria, a little town on the opposite side of Cadiz Bay. It seemed as if everything conspired against us in that job. For one thing, the place was over an hour's journey by rail from Cadiz, and as we had other occupations than electrical contracting we could not work at the job continuously. We used to start off in the mail train at a little after five in the morning, with a Gladstone bag packed solid with wire and fittings, do what we could in the morning and get back in the afternoon to Cadiz to do a spell of eight hours "spot-watching." Putting up electric bell wires all the forenoon and handling cablegrams from 4 P. M. to midnight makes a fairly active day's work, and those days we certainly earned all we made. Even in the sunny south of Spain the early morning hours of a winter's day can be particularly dark, cheerless and chill, and well do I remember some of those 5 A. M. expeditions when one's warm bed seemed the only place in the world fit for a civilized being to be in.

The proprietor of the Puerto Santa Maria Hotel was a little man from the North, a thorough man of business, and as keen an inspector of anything he had to pay for as I ever saw. He watched us as a cat might watch two mice trained to do work for cats, and nothing escaped him. The house was solidly built of stone, with walls two feet thick, and there was no way of running wires through the walls or even of stapling them to the walls, so we had to adopt the regulation Spanish method of running inside wires, which is to attach them to little bone insulators, like miniature cotton spools, fastened to the wall by wire nails. We used up a prodigious quantity of wire, as there were so many large rooms and long corridors, and when the additional supply came that we ordered when partly along with the job our proprietor immediately noticed that it was not of the same quality as the first lot. True enough, the covering (it was rubber covered wire wrapped with cotton) was not quite so stout as that of the wire we began with. There was high indignation at first over this departure from samples, but we managed to pacify our customer and to convince him, much against the grain, that the wire was practically as good as the first batch.

Then the annunciator came, and there was the devil to pay. It was not at all what we had ordered, was put up in a cheap-looking case and had an electrical restoring movement which would not restore. Boniface was enraged and so were we. After many fruitless efforts to adjust the indicators so that they would restore properly, we gave it up as a bad job, shipped the whole outfit back to England and insisted on the mechanically restoring indicator we had originally ordered. This eventually came and when put up it gave perfect satisfaction. In the long run we did a good job for our exacting friend, but there were many times when we wished him and his hotel and his bells at the bottom of the Atlantic. As for profit, I think we spent it all on expenses going to and fro between Cadiz and Puerto Santa Maria.

Our venture into electric lightning was more productive and more agreeable in every way, as on this occasion other people did the work and we got a fair share of the profit. A maritime exhibition was to be held in Cadiz, in celebration of I do not at this time remember just what, but partly intended to revive the failing fortunes of Cadiz as a port. By methods well understood in Spain and not unknown in other countries, but not worth here describing in full, we secured the contract for the electric lightning, and we then got an English firm of electrical engineers to take up the job, we and our side partner retaining a modest commission on the contract price.

There was a dear old gentleman in Cadiz—he is probably there still, either alive or buried—who was a devoted amateur in electricity. He subscribed to every electrical paper published in

every country in the world, had an extensive electrical library and a laboratory in which he dabbled in all sorts of unprofitable experiments. When the specifications of the plant we were to furnish for lighting the exhibition were published this distinguished amateur wrote long letters to the papers alleging that the generating plant could not possibly supply the number of lamps specified, and that he could supply the exhibition much better from a plant he would install in his own house—which was some two or three miles from the exhibition. He came near upsetting the whole business, and incidentally leaving the exhibition without light, for he could not possibly have made good his own offer. But we pointed out that he had confounded nominal horse-power with actual, and had made a few other trifling mistakes, and the contract went through all right. The plant was brought out from England and set up in good time, and the lighting of the exhibition was a great success. I think it was about the only part of the exhibition that was paid for in full, but we saw to that. When the exhibition closed we sold part of the plant at a fair profit, and altogether that electric lighting contract was quite a help to the finances of our firm.

Another electric lighting incident afforded us some amusement and a little cheap advertising, but otherwise no practical results. Through some complications between two rival gas companies Cadiz was for several days wholly deprived of gas, and there was consequently an urgent demand for other means of illumination. This seemed like a good opportunity for us to get a little advertising, so as we had some miniature incandescent lamps among our miscellaneous stock of electrical goods we charged up a set of bichromate batteries and set up a lamp in the window of the leading café on the main street, with our card carefully attached. We left the lamp burning white and bright, the center of an admiring throng. But it was going too white and bright, for when we returned in an hour or so to observe progress we found it had burned out. There was a fussy old gentleman bending over it trying to get it started again with a lighted match. We gently explained that incandescent lamps did not work that way, and proceeded to remove the installation, as it had been the last good lamp we had. There was a nice little crop of newspaper notices the next morning regarding our highly interesting experiment, and, with true Spanish courtesy, none of the writers made reference to the rapid and sudden eclipse of the lamp.

Our last big telephone job was a line for the Spanish Transatlantic Company, the concern that owns the extensive lines of steamers trading between Spanish ports and various parts of the world. The *Trasatlantica*, as the company is called in Spain, had big offices in Cadiz and large dockyards and repairs shops on the other side of the bay, so a telephone line between the two was practically a necessity. They had a line skirting the bay, but it was constantly breaking down and was more of a nuisance than a convenience. We proposed building a new line, comprising a land line to the nearest point opposite the dockyard, and a cable across the bay, nearly two miles wide at that point. Our proposition was accepted, and we had quite an interesting time laying that cable and completing that line.

We bought from our own company in London two miles of deep sea cable, for which they considerably charged us full price. The cable was shipped out on two large reels, and when we got it the problem was how to lay it. There is a fair tide and a fair depth of water in Cadiz Bay, and the job of laying that cable, without any of the proper appliances, was no simple one. However, we were good friends with the engineer in charge of the dockyard—a sturdy Scot, of course—and he very kindly placed at our disposal not only the dockyard tender, but all the resources of the shops we might choose to avail ourselves of. So in a very short time we converted the tender into a very fair imitation of a cable ship. By means of two sets of winch-bearings mounted on heavy barks we set up the cable drums so that they would revolve freely, placing one each side of the engine room hatchway. A large iron pulley mounted near the taffrail served for a stern sheave, and such refinements as jockey-wheels, dynamometer, holding back gear, and so forth, that deep-sea cable-ships carry, we cheerfully dispensed with. Two long planks, one end bearing on the deck under the drum, the other controlled by one of the tender's crew, served as very efficient brakes for the paying out drum in use.

LONG DISTANCE TELEPHONY—AMATEUR vs. EXPERT

By JOSEPH B. BAKER

THE mail is quick, the telegraph is quicker, but the telephone is instantaneous." Most of us are familiar with the words, but do we grasp as we might the possibilities in their significance? When we write on a piece of yellow paper and hand it in at the little window to the man who checks it up with a pencil and says, "30 cents, please," we go on our way rejoicing in the prospect of an answer within two hours. But when instead we take down our telephone from its wobbly hook with hostile thoughts in anticipation of the \$4 it may be going to cost, do we think of how nearly really "instantaneous" we might make our wired talk if we only considered a few things about the telephone in comparison with that yellow sheet and its look of 30 cents?

The fact is that it is harder to run a toll line telephone business, where the charge is so many three-minutes' worth for the two hundred and fifty miles from Boston to New York, for example, than it is to handle telegrams between those much-both-ways-communicating cities. The man at the little window may take in the yellow slips with a very telegraphic, business-like air; but he doesn't worry when they come in thick and fast, because he knows he can pour them into his "outward wires" in succession if he takes all the morning till far beyond the "busy period," and still be safe to send the blue boy with the *degagé* cigarette air, and the consistent freedom from hurry, bearing the backcoming reply within the two hours. But it is a different thing when it comes to hearing the actual voice of the man you want to reach in an electric hurry. When you have made up your mind about that four dollars, it is because you know that in a matter of ten minutes or so your man will be personally before you, for all practical purposes, ready to do with you the business of a very great many thirty cents' worth of written messages. What if it could be made three or four minutes' wait instead of ten, and nearer thirty cents in cost than four dollars? The yellow slips would get to be few and far between, and it would be your fault that they did; for the simple reason that it has got to be through public co-operation that telephone service shall be rendered more efficient. I mean that the instruments and switchboards and lines are all ready—which means that the companies are also ready, whether willingly or not—for lower rates and quicker and better telephone service everywhere, and it isn't half so much a matter of patent rights, Supreme Court decisions and anti-monopoly competition as it is of the growth of the common-sense use of the telephone by the public.

When you go to take a train to New York you know that, for the greatest good of the greatest number, the railroad company starts a certain number of trains at certain hours and provides certain places for buying your ticket. You comply with these arrangements, which on the whole are good and convenient and just, or you get left. That's all there is to it: the transportation is there if you choose to avail yourself of it under the known conditions. If one is slow in getting to the train, or stupid at the ticket-window, one injures only one's self. The public service given by that train to the people who meet its simple requirements—who, in a word, give their co-operation to the engineering and business skill that make railroads the means of "rapid transit"—is not interfered with a particle. But how is it when one concludes to telephone instead of travel? I wish to point out that this service of "rapid communication," unlike the railway service, does suffer as a whole by the faults of individuals, because the American public does not give common sense support to an American art; that the failure to get on board lively and pleasantly does make the telephone work more slowly and cost more for every one.

Now, perhaps, the best way to make this clear is to give a hint or two as to what a wonderful and complex art American genius has made of long distance telephony. When you "put in a call" for a point on the long distance wires you are taken in hand—though you don't know it—by no less than five different young lady operators in the process of connecting your station to the operator who "takes your call" or writes down the place whither and the person to whom and by whom the talking is to be done. At the same time more different things happen to that particular telephone line, in getting it ready for the coming long talk and in protecting it from interference by other calls, than any

layman in matters electrical, would care to attempt to follow. A great deal of beautiful apparatus is in use at "Central" to accomplish the saving of a fraction of a second here and another fraction there, because the fractions mean many minutes in the aggregate, and because the minutes come at times in the handling of the traffic when they are precious. Now, what is the use of a two hundred thousand dollar switchboard and of the small army of clever young ladies who are trained in its use when that other and vastly bigger army of telephone operators—the public, to wit—are not only careless and untrained, but simply unbusinesslike in ways they would be ashamed of before the railroad ticket agent or in timing their walk to catch a train. Let us take a few examples out of many. What's the use of the transmission in eleven seconds of one's call for John A. Robinson, number forty-blank Broadway, with a request for Mr. B. Jones if Robinson is out, to be talked to by Richard Roe, of Boston, when neither of the New Yorkers makes much effort to talk distinctly when he comes to his telephone and it takes fifty-seven seconds for the operators to make him do so and so "start the call"? Or why does the Boston man—I must call him Mr. Reuben Hayseed this time, though his office is on State street—insist on taking two minutes and three quarters in telling the operator what he wants in his own profuse language when he could have helped her to run her business and the telephone company's, which is his business for the time being, by answering her four simple questions in twenty-six seconds? Such things are very sad to look upon from the viewpoint of the switchboard force staggering under the load of the "busy periods" each day. They mean many hours of lost time in the aggregate, on which to compute wages and interest and depreciation of costly plant. In the telephone book are two photographs illustrating the "right way" and the "wrong way" to use the telephone. I am going to ring off my telephone talk by citing the right way and one of the wrong ways to make a long distance call.

The wrong way first, by Mr. R. Hayseed at his State street office. He signals his operator and she says: "What number, Haymarket?"

"I want long distance."

"Where do you wish to talk?"

"Why, long distance, I said!—Well, then, I want to talk to New York, if you won't give me long distance unless— Now, I don't want to tell this over again, I want New York, and I want it quick—!"

Now, only the first part of this tirade delayed things, because when our friend got to the words "New York" his operator started the process of connecting his line to the proper operator for New York calls. So that in a little while Mr. Hayseed hears another operator say:

"This is long distance."

"Oh, dear—have I got to tell you, too? How many different people—?"

"Where do I wish to talk? Why, I told the other operator,— New York—Who? —Why, Mr. Smith in New York City, Yes, Smith, Mr. A. B. Smith—And say, let's see, if he isn't in his office, ask for Mr. Johns, but remember I want Smith if he's there. Where is he, you say? Why in New York, New York—Oh, yes, his office is at forty-blank Broadway, or may be it's fifty-blank. You look that up, will you, because I don't—the firm name? That makes no difference, I want Mr.— Well, then it's Smith, Johns & Co., number forty-blank or— Why, I am going to talk here, of course!— Yes, right at this telephone. Now is that all you want to know, because I'm in a hurry, and— Who am I? Oh, do you want to know my name, you say? Well, then I'm—"

But we know his name already, without having had to wait the two minutes and a half it took him to get to that point in his story.

Now for the right way, by a man who, one feels, simply has a respect for time and knows that a telephone communication, like any other, ought to show for whom and by whom it is addressed. To him, as before, the operator answers:

"This is Long Distance."

"Long Distance, New York?—I want Mr. A. B. Smith, of the firm of Smith, Johns & Co., New York. Don't know their

address, but they have a telephone. If he's not in I'll talk to Mr. Johns. This is four blank six Haymarket, Mr. So-and-so talking."

Time, twenty-three seconds all told.

This is merely an example. What are the remedies for such a state of affairs? Educate your subscribers. Teach them that there must be harmony through co-operation; remembering that, though the telephone is a machine, the operator is human and normally very busy; an attitude of ordinary business civility and respect such as obtains in face-to-face transactions; saving of time—where time is so obviously money,

yours to save because yours and the telephone company's otherwise wasted—by "speaking up" in the first place and by "ringing off" or "holding the line," or other reasonable things when asked. Second, on the telephone company's part, by instruction cards, or paragraphs of instruction in the telephone directories, by personal instruction of the company's agents, by the increasing use of branch exchange switchboards competently managed, the education of the public by the company. But, behind all, must be a mutual confidence that ought not to wait for destructive competition between old telephone companies and new ones, with the same problems to meet and overcome.

IN THE OPERATING FIELD

TWO PROSPEROUS COMPANIES

THE Valley Telephone Company, of Saginaw, Mich., has declared a two per cent. quarterly dividend. The directors at a meeting on July 10, adopted a resolution to this effect. And not the least remarkable part of this excellent showing is the fact that this same resolution has been adopted for fifteen consecutive quarters. Not once has the company suspended its quarterly dividend. The Valley Company is operating over 3,100 telephones in its exchanges at Saginaw, Bay City and Flint. It owns and operates 210 miles of toll lines, equipped with 280 miles of copper metallic circuit, and besides this many miles of iron circuits for service between forty stations from Bay City to Flint, and between Saginaw Valley and Huron County. It has substations at Sebawaing, Clio, and other points, and has long distance connections with 800 points in Michigan, over the circuits of the Union Telephone Company and the United States Telephone Company.

If there is any doubt that Independent telephony is a safe investment, the above figures should clear away that doubt. As a further proof, here is another item, culled from our news report. "The Syracuse Home Telephone Company, of Syracuse, Ind., has declared a semi-annual dividend of four per cent." And not alone is the Syracuse a dividend payer, but it is spending money constantly in improving and modernizing its plant. New subscribers are coming in all the time, and all in all the prospects are very encouraging.

The Independent telephone movement is a popular movement; it is spreading, and it is paying its way handsomely.

AN AUTOMATIC RECORDER

ACCORDING to the *Leader*, of Lexington, Ky., an inventor of that city is about to fill a long-felt want in telephone working by supplying an appliance which will answer a call for an absent subscriber and record at the called station the number of the station that has made the call. Such an appliance, if reliable and cheap, would add much to the usefulness of the telephone. The *Leader's* account of the present status of the invention, which we print below, does not encourage us to hope that it will soon be on the market:

"L. A. Leavell, the well known colored local attorney and inventor, has just contrived another remarkable device which bids fair to be of financial value to its originator.

"His device is a contrivance called a Telephone Reporter and Recorder. He claims that one telephoning the office or residence of another can be informed when the person desired will return, although there is no one present to answer the 'phone, and can also leave a number to be called up when the person desired returns.

"The first part of the invention is operated by a gramophone attachment set in operation by the ringing of the telephone bell. By setting a dial before leaving one's office or residence, the gramophone will be made to answer, for instance, when called, "Will return at 3:50 p. m. to-day," or at some other time as the case may be. By another arrangement the person calling can leave a number to be called, which will be recorded in typewritten fashion on a piece of tape.

"He is at present at work on the original model to send to the Patent Office. He, however, lacks funds to have the instrument manufactured, and is desirous of selling a third interest in the invention."

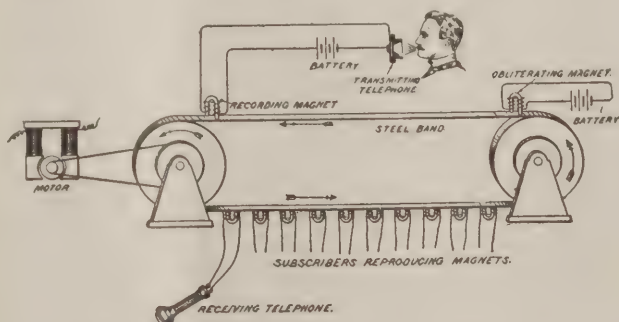
A FINE TELEPHONE SYSTEM

THE telephone system in the town of Lenox, Mass., is one of the very best in this country. Every cottage has a beautiful quartered oak telephone table. A handsome desk set stands beside the silver ornaments on the table. These latter include writing pad, pens, ink, tablets, etc., and directory of 100 connections to be obtained by calling central. But not a wire is to be seen. The *Pittsfield* (Mass.) *Call* tells how this was accomplished in the following words:

"The town's telephone service is maintained by the use of the conduit system, expensive, but out of sight. Not a wire overhead, except in the outskirts, offends the vision and not a pole makes an ugly interrogation point on the beautiful avenues. In order to maintain the conduit system the town had to pass an ordinance forbidding the erection of poles for the use of electric light, fire service or telegraph or telephone service. The cottagers were given the option of obtaining the telephone service at a high cost or going without it. For several years they rebelled. They used messenger service and the telegraph. Then they gave in and built at their own cost the telephone lines to their different residences, using miles of conduit. The result is one of the most perfect systems of telephones of any town in the country. Recently three cottagers clubbed together and built a mile of conduit for telephone service. There was no kick about it. They had become converted to the conduit system and realized that the telephone plays an important part in daily life."

A TALKING NEWSPAPER

It is now proposed to utilize the telegraph as a talking newspaper. In the figure is shown the proposed method. As the steel ribbon, which in this particular form is endless, passes from one reel to the other, as indicated by the arrows, it passes consecutively before each of the receiving magnets, and the subscribers, whose telephones are connected to these magnets, may thus constantly be supplied with the latest news of the day, stock quotations, etc. After the ribbon or band has passed the receive-



ing magnets, the obliterating magnet wipes out all of the magnetic lines of force stored up in the steel band, and it then passes on to receive fresh impressions from the recording magnet and telephone. In Budapest, a telephone newspaper system is run, which also supplies its subscribers with music and talking from the theatres by means of the "theatrophone." During the day the subscribers are constantly informed of the latest news of importance. This service, which supplies many thousands of subscribers, is independent of the regular telephone service.

BATTERIES FOR TELEPHONE WORK—

V. The Selection and Care of Batteries.

IT is of the greatest importance that the materials used in telephone batteries should be of the best quality and well put together. The efficiency of a battery telephone, if the instruments and connections are in good order, which is always supposed to be the case, depends on the battery; so if batteries of good quality are not used the general efficiency of the system is handicapped from the start. A battery may be of good quality and well made, with the adoption of every known device to prevent it from easily getting out of order, yet its effective working may be spoiled by the use of impure chemicals in the solution or by neglect and carelessness in maintenance. Therefore to be sure that we are getting the best service a battery can give we have to see, first, that it is made of good materials properly put together; second, that it is properly set up, with solutions that are as free as possible from impurities; and third, that it is maintained in good condition.

The amount of care and attention that telephone batteries require, and the inherently weak spot in the system that they are, furnish one of the strongest arguments in favor of the central energy system. The central energy system, however, is expensive to install, and is beyond the means of small places, so that many telephone men will probably continue to use batteries for a long time to come. They have the satisfaction of knowing that a battery telephone gives better talking than a central energy telephone, and that with the batteries in good condition the battery telephone is still the most efficient instrument there is for long distance talking.

The essential points to look out for in the selection of batteries are good materials for the plates, a proper type of binding post and a firm connection free from the risk of corrosion between the binding post and the plate, a covered containing jar and some special treatment of the containing jar to prevent "creeping" of the solution. The carbon plate should be of dense gas-retort carbon in a hard, solid piece. Carbon of good quality has a smooth hard surface, with a fine grain and an appearance rather lustrous than dull. The binding post should be so attached to the plate that there will be no risk of the production of a bad contact through the solution "creeping" up and causing corrosion of the metal. The old form of Leclanché carbon, in which the binding post is set in a lead cap cast on the top of the plate, is somewhat liable to this trouble. To prevent it the upper part of the carbon is soaked in melted paraffin, which forms a surface on which the salt from the solution does not readily crystalize. Even with this precaution, however, the solution will occasionally reach the cap, attacking the lead and binding post, sometimes with the result of bursting the joint between the lead cap and the carbon plate. A better form of connection for the binding post is to bolt it to the carbon plate by drilling a hole through the plate and securing the post with a nut and washer, the shoulder of the binding post being then locked tightly against the carbon. The best form of binding post is that furnished with lock-nuts and washers, which holds the connecting wire securely and does not cut it or bruise it as the dome-shaped binding-post, in which the wire is clamped by the point of the screw, is very apt to do.

The zinc element of a Leclanché battery should be a rod of pure metal weighing about three ounces. In some forms of battery a plate or a cylinder of zinc is used instead of a rod; when the zinc is of plate or cylinder form it should be of rolled zinc, not cast, as cast zinc is more liable to contain impurities than the rolled metal. The zinc rod or plate should be thoroughly amalgamated, first cleaning it with dilute sulphuric acid and then rubbing mercury over all the surface of the zinc until it is evenly covered with a film of mercury, as described in a previous article.

The solution used for all batteries of the Leclanché family, either regular Leclanché batteries with depolarizer of dioxide of manganese, or zinc-carbon batteries without depolarizer, which are simply a cheaper form of the Leclanché cell, is a saturated solution of sal-ammoniac. The sal-ammoniac should be of as pure a quality as can be obtained. Chemically pure sal-ammoniac is naturally too expensive an article to use for battery solution, but in commercial sal-ammoniac there is much variety of quality, and the use of an inferior quality will give rise to much trouble with the batteries. If there are many impurities in the solution the battery will get into a dirty condition, chemical deposits will

be formed in the cell and on the zinc plate and the working efficiency of the battery will be lowered and its life shortened.

It is highly desirable therefore to secure the best quality of sal-ammoniac that can be had, the surest means of doing so being to buy from a reputable dealer and to pay a fair price. Even then it is well to test a sample occasionally to make sure that the quality of the material is being maintained. One test is to add to a solution of sal-ammoniac a small quantity of barium chloride and hydrochloric acid. If the color and clearness of the solution remain unchanged after the addition of the hydrochloric acid the pureness of the sal-ammoniac is attested, but if the liquid becomes discolored and a precipitate is formed, the test proves the presence of impurities in the sal-ammoniac which render it unfit for use in battery solution. Another and simpler test is to heat a small quantity of the chemical in the flame of an alcohol lamp. If the sal-ammoniac is pure it will all go off in white fumes under the action of the heat; if after continued heating a white substance is left the sal-ammoniac tested is of poor quality and should be rejected.

It has been said that the solution employed with Leclanché batteries is a saturated solution of sal-ammoniac, and this is the general practice. It is better, however, to use a solution that is not quite up to the saturation point; that is, that has been slightly diluted. This gives a margin for evaporation to occur without causing the solution to become over-saturated and deposit crystals; consequently the danger of "creeping" is reduced. "Creeping," or a deposit of the sal-ammoniac in a coating of fine crystals on the containing jar, porous pot or carbon plate, is easily started from a thoroughly saturated solution, as with a super-saturated solution but a slight amount of evaporation is required to cause some of the sal-ammoniac to be forced out of the solution and deposited in a solid form on the neighboring surfaces of the jar or plates. The best way of making the solution is to prepare a saturated solution and then dilute it by adding about one-twentieth of its volume of water. The solution should be strained through a filter of coarse cloth to take out all dust and floating particles of foreign matter. This, perhaps, may seem like excess of caution, but it is worth the extra trouble to give the battery a good start with a thoroughly clean and pure solution. In setting up batteries with porous cups a small quantity of the solution should be poured into the porous cup through the hole in the sealed top; this causes the porous cup to become saturated quickly and evenly and makes the battery ready for use quickly. The tops of the containing jars are generally coated with paraffin, or some other wax compound, to prevent creeping, and the surface of the solution should not be higher than about half an inch below the lower edge of this coating.

The points to look out for in the inspection of batteries are creeping of the solution, discolorization of the solution, pitting and eating away of the zinc and exhaustion or evaporation of the solution. The latter will naturally occur in the course of time, and the remedy of course is to renew the solution. If signs of any other of the troubles indicated are noticed at any time remedies should be applied at once. If creeping occurs, or the solution is discolored from foreign substances falling into the cell, or from impurities originally in the cell, the battery should be taken down, all parts thoroughly cleaned and set up again with a fresh solution. If the zinc is observed to be wearing irregularly it should be scraped and cleaned and re-amalgamated. If the zinc is very badly worn and pitted it should be thrown away and a fresh zinc substituted. Always set up batteries after cleaning with a fresh solution and never add sal-ammoniac to an old solution. In setting up or inspecting batteries take care not to wet with the solution any part of the jar or plates above the normal level of the solution; neglect of this precaution is almost sure to result in creeping, one of the greatest troubles with primary batteries. In cleaning batteries with porous cups the porous cup should be thoroughly soaked in fresh water for some time in order to remove all trace of the old solution. When carbon blocks and agglomerate blocks are used they should be thoroughly cleaned with fresh water and scraped or brushed to remove all impurities that may have clung to them. The carbon element will generally be good for several renewals of the zinc element if the cell is properly cleaned and set up at each renewal but in time it will get impregnated with salt and the resistance if the cell will then get so high that it is better to put in new batteries.

BUILDING A TOLL LINE

By H. V. BASTIN.

IT seems to me that less has been written about telephony than about any other branch of electrical engineering. The electric light, the electric railway, wireless telegraphy and the automobile have been discussed times without number, and are more or less understood by the average man, but that mysterious little hole in the wall, the telephone, and the machinery that lies behind it, are still full of mystery for the masses. It is a fact that from more than one engineering college a student may be graduated, with an electrical degree, and not know the function of a battery in a telephone.

I judge that this ignorance is a result of the Bell monopoly, and as that monopoly breaks down, the telephone science will rise and take its place with other sciences in our colleges and universities.

As the Bell patents have been out only six years, we are bound to call the broad field of telephony a new engineering problem. But, by Yankee pluck, luck and skill, we are rapidly forging to the front, trampling under foot all difficulties, and bringing near the day when the drummer in Southern California can telephone his orders to the house in New York. To accomplish this result we must construct better toll lines. To build good toll lines we must have good material, the right kind of material; put up by the best labor, under the management of a competent engineer. To those who have not the best labor and engineering facilities, I address these remarks.

As the farmer party lines form a very important part of an exchange system, we must keep them in mind also, when we design our pole line.

To take care of both toll and party lines we must have poles of sufficient height to accommodate both. For two cross-arms we can use 25-foot poles, but for more than two cross-arms we had better have 30-foot poles. These poles should be of red cedar or chestnut, seven inches in diameter at the smaller end. The tops should be roofed and well painted with lead and oil. The gains should be cut shallow, not more than $\frac{1}{2}$ inch deep in middle. At least two extra gains should be cut while the pole is in the yard, but holes should be bored only for the arms to be put up immediately. The gains also should be well painted. The butts should be treated with hot creosote for at least seven feet.

The cross-arms should be of white pine 10 feet long 3x4 inches, and bored for 10 pins $1\frac{1}{2}$ inches in diameter; they should be painted with two coats of lead and oil. Pins should be of locust $\frac{1}{2}$ inches in diameter. Pins should fit tight into cross-arm and be nailed with No. 6 wire nails. Braces should be fitted on the arms while the latter are in the warehouse; they should be 24x1 $\frac{1}{4}$ x $\frac{1}{4}$ inches, of galvanized wrought iron, $\frac{3}{8}$ -inch hole in one end, and $\frac{1}{2}$ -inch hole in other. The braces should be fastened by $\frac{3}{8}$ x2 $\frac{1}{2}$ -inch lag screws, 17 inches from the center hole.

We will now order our anchor rods and guy strand. The number of rods required depends entirely upon the road, but if you get rather more than are absolutely necessary they will not be a bad investment. The rods should be of galvanized iron six feet long, $\frac{3}{4}$ -inch in diameter, with nut and washer on one end and welded eye on other. The guy strand should be of No. 12 steel wires twisted into a rope.

Now that we have our poles ready to erect, we will look out for our holes. Never dig a hole until you have your line staked out. Never cross the road when it can possibly be avoided. Pick the best side of the road, and stay there. The best side is usually the side where timber will be least in the way of the wires. The risk of accidents is considerably increased if the line crosses the road often. It is a well known

fact that wires have a mysterious way of breaking down on frosty nights, or during a sleet storm, and one wire down across the road is liable to cost the company more than the entire line is worth. It is really no mystery that a wire breaks; for if we examine a break we shall find, as a general rule, that it was caused by a kink, nick, burn, or flaw in the wire, the first three caused by careless linemen, the last due to defects of manufacture.

There is nothing that gives a line a better appearance than a true alignment of poles. To accomplish this it is expedient that you have a surveyor's transit, which can be borrowed or hired from a local surveyor. In staking out the route you will need two men, one to handle the transit and one to drive stakes. Set up the instrument on a curve, with the bob over the corner stake, always being sure to level the head. Choose the position of your next corner stake, and turn the head of the transit until the vertical cross-hair coincides with this position, then clamp. The telescope can not be turned only in a vertical plane. Now let your helper step off 50 paces ($42\frac{1}{2}$ yards) and set up his pole, motioning him to the right or left until the pole coincides with the vertical cross-hair. Proceed in this way, and you will get all stakes accurately in line. It is well to get corner stakes as near as the fence as possible when the road bends toward the line, and as near the road as possible on contrary curves. This will usually permit of anchoring outside the fence in the latter case, and save a guy stub in the former. In staking anchor holes remember that an anchor is not effective if within four feet of the pole, but if conditions permit place the anchor ten or fifteen feet from the pole.

The holes for 25-foot poles should be $4\frac{1}{2}$ feet deep, and for 30-foot poles 5 feet deep. Set the poles so that the arms will alternately face each other. Always tamp the poles in solid. A good old rule is "put all the dirt back in the hole that came out of it." The anchor holes should be 5 feet deep, 4 feet long and 2 feet wide. The anchor blocks may be of any sound timber, $3\frac{1}{2}$ feet long by 18 inches in diameter. These should also be tamped in tight.

It is best to use clamps for fastening the strand on the rods, as they leave no slack and are easily removed in case you wish to tighten the anchors. The strand should pass twice around the pole, and then around itself six or eight times. It is a good idea to secure the strand to the pole by three or four staples, which will prevent it from slipping down on the pole and giving slack to the anchor.

Cross-arms should be put on with $\frac{5}{8}$ -inch square-headed bolts, large washers under both head and nut. The nut should screw down on cross-arm.

A good heavy insulator should be used, and for transpositions always use the two piece insulators made for that purpose.

Now last, but most important of all, is the wire. Never use anything but copper or aluminum. Solder all joints, and be very careful that your linemen do not nick or scratch the wire, as these apparently trifling injuries will cause breaks sooner or later. Do not pull copper too tight, as it will not stand the strain that steel wire will; give it three or four inches slack in the middle.

To prevent cross-talk the circuits must be transposed exactly right. To this end it is best to consult some good engineer. State your exact conditions, and let him draw you a plan. It is quite easy to transpose two or three circuits successfully, but more than this number gives us a rather knotty problem.

TELEPHONING FROM A MOVING TRAIN.

Telephoning from a moving train was accomplished by means of the invention of Dr. A. D. Jones, a citizen of Louisville. The first intimation that the feat was a success came the other afternoon, when a telephone bell rang in the office of A. M. McCracken, general superintendent of the Louisville, Henderson and St. Louis railroad, at Louisville, and a conversation held with Dr. Jones on a train going at a speed of ten miles an hour.

Dr. Jones secured a patent on his invention—known to the pa-

tent office at Washington as a traveling contact device—two or three weeks ago and immediately interested Attila Cox, president of the Louisville, Henderson and St. Louis railroad, to the extent that he was given authority to make a practical test at some point on the Henderson route. Dr. Jones selected a mile of track between Cloverport and Stephensport, at Hoyt's bottom, for the test, and a car for his use preliminary to the trial was placed at his disposal.—*Columbus Press*.

Opinion and Comment

TELEPHONE OPERATORS.

IT has been the good fortune of THE AMERICAN TELEPHONE JOURNAL to publish lately several articles from the pens of talented and experienced contributors bearing on the importance of the proper selection and training of operators, a point which we have previously discussed on one or two occasions in this column. It is a point that can hardly be too often or too fully discussed by telephone men, since the operator has it in her power not only to give the company a good or a bad name according to her aptitude and intelligence, but also to raise or lower in quite a sensible degree the efficiency of that company's plant in proportion to her own efficiency, or lack of it. In a previous issue we printed a most interesting and ingenuous article on telephone operating from the operator's own point of view—probably the first article of the kind that has ever been printed—and the very clear-headed young writer amply confirms by her own opinions of what a telephone operator should be and should do, the observations of Mr. McCluer and Mr. Stanton, who so emphatically attest to the good results that follow from the careful selection and training of operators.

What makes so powerfully for the fascination that telephony has for those engaged in it is its sociological interest. No other industry, hardly even any of the learned professions except it be this respect. The use of the telephone is accompanied by almost constantly as does the telephone service. Certainly no other mechanical industry even remotely compares with telephony in that respect. The use of the telephone is accompanied by almost every human emotion. The telephone plays a part in almost every one of the human dramas that hourly occur around us. Often the use of the telephone is prompted by emotion; sometimes the emotion is aroused by the use of the telephone. In communication between multitudes of men there is necessarily friction and there are necessarily errors, just as there are friction and failings in the movements of vast collections of machinery. We all know how peculiarly exasperating friction, delays and errors are when the telephone service is concerned; the helpless situation of the telephone user magnifies the effect until in persons of nervous temperament it becomes irritating to the last degree.

Now the lubricant for this friction, the cure for these errors and for these delays in the telephone service, are suavity, accuracy and rapidity on the part of the operator. Nowhere does a soft answer turn away wrath so effectively as on a telephone line; nowhere are a soft voice and a pleasant manner so necessary as in a telephone operator. Bad mistakes or long delays may occur, but if the operator is uniformly polite to the subscriber, explains and apologizes as she would in ordinary intercourse for having caused inconvenience to any one, most men will forgive the error or delay and bear no grudge. But even quick and accurate work is partly spoiled if accompanied by a gruff voice and a curt manner, while such a voice and such a manner immeasurably increase the annoyance caused by errors and delays. Therefore, above all things insist on suavity from your operators, on their cultivating pleasant voices and pleasant manners, and speaking always to the subscriber as they would to any one in whom they wished to make a good impression.

If suavity is the most important quality in an operator, surely accuracy comes next. It is better to connect the right number in ten seconds than the wrong number in five. Telephone users themselves are largely responsible for "wrong number" by talking indistinctly, by trusting to memory, even by reading numbers off wrongly. But the operator who has a jerky, curt way of talking, and so fails in the first requisite, usually has also a slapdash way of working and fails also in the second. She does not listen properly, and often does not repeat the number back properly, or repeating it does not give the subscriber time to check it. Inaccuracy in telephone operating means waste of energy and waste of time for all concerned. In a busy exchange the loss of efficiency through careless and inaccurate operating may be quite serious, and the effect on the subscribers is to give them a cumulative feeling of impatience and irritation, a growing sense that they are not getting what they are paying for, which is a very bad impression to leave on your customers.

Rapidity in operating, which is the only point generally mentioned in reference to the working of the telephone service, we place last of the three cardinal points of telephone operating, and, we think, logically so. We are far from denying the importance of rapidity in operating, both as regards meeting the public requirements and increasing the efficiency of the plant. Dealing with tens of thousands of connections a day, a second of time, more or less, in handling the average connection is of great importance both to the telephone subscriber and to the telephone company. But it is first necessary to conduct the service smoothly and make it popular with the subscribers. There will always be mistakes and there will always be delays, but the service that is uniformly civil will counteract the vexations that those mistakes and delays cause. The service that is as accurate as it can be made will naturally be freer from mistakes and delays than the service where only rapidity is thought of. Finally, the staff that is trained to uniform civility and the highest pitch of accuracy will contain the kind of material that will be the most likely to give a rapid service.

INDEPENDENT SECURITIES.

An excellent idea of the value of Independent telephone properties as an investment is furnished by *Finance* (Cleveland), one of the most important financial papers of the West. Discussing the securities of the Toledo Home Telephone Company, *Finance* says:

There has been considerable inquiry in Cleveland this week for the stock and bonds of the Toledo Home Telephone Company. The bonds of the company, with an equal amount of the stock, have sold at par, while in Toledo 101 is asked for bonds and stock. Some bonds sold in Cleveland at 80, and blocks of the stock at 20. Both the bonds and the stock are considered a good investment at this figure, and it is freely predicted that the bonds will reach 90 before the end of the year and that the stock will reach 50. There are those who predict that the stock will be on a six per cent basis within one year, which of course would give it a market value of over 80. The plant is bonded now for about \$980,000, or a little more than the original bonded indebtedness of the Columbus Citizens at Columbus. The plant has been constructed in a first class manner, and it is thought that the proposition will eventually work out to be as good, if not better, than the Columbus proposition. The Columbus stock is now selling at 80 and pays a six per cent. dividend.

The time is here when the stock and bonds of Independent telephone companies may be assured good attention. The only requisite is that their value shall be properly and steadily presented to the public. This is an important branch of work which should be systematically looked after by the National and State Associations.

CONTEMPORARY CROSS-TALK

BY a simple use of figures—imaginary figures it is true, but not so imaginary that they do not rather understate than overstate the difference in service rendered between a small and a large telephone system—we illustrated in our last talk on the rate question the fundamental reason for the greater cost of telephone service in a large city as compared with a small place. Like the ingenious methods of that distinguished investigator, Mr. Sherlock Holmes, once explained it is as obvious as the nose on a man's face. If the minute-mile is the true unit of telephone service, as the pound is the true unit of mutton, it is plain that the man who uses a hundred minute-miles should pay more than he who uses only ten; just as plain a proposition, in fact, as that no sane butcher will sell you a leg of mutton weighing ten pounds for the same price as he will sell you a mutton chop that weighs only one. If you look at the thing in this light, flat rates for telephone service are just about as sensible as flat rates for butcher's meat would be. If you proposed to your butcher to pay him so much a month for as much meat as you might want for your household, you to have whatever kind and quantity of meat you might choose to demand, day in and day out, and at any hour of the day or night, he would laugh at you; or more likely, if he were a violent man, as butchers sometimes are, he would throw his chopper at you.

* * *

True, butcher's meat is a commodity and not a service, and telephone service is a service and not a commodity. Which is precisely the reason why telephone rates are such a perplexing problem and have until now so perplexed not only the public and the public's representatives—press and legislators—but the telephone men themselves. Now that the true unit of telephone service has been discovered and disclosed in these paragraphs the problem ought to be less perplexing in the future. Having introduced butcher's meat into the controversy, I fancy I hear some dyed-in-the-wool adherent of flat rates saying something like this: "Ha, ha, Mr. Listening-Key, but how about *cooked meat*? Have you any difficulty in getting a flat rate for *that*? Will not any hotel or restaurant give you the 'run of your teeth' for a flat rate, payable weekly, monthly or even yearly? And is not that something like telephone service?" To which I must surely answer, "yes." And it is something like telephone service, but—but there is a whole string of buts when you come to investigate this comparison, so they demand a paragraph to themselves.

* * *

Certainly there are many hotels and restaurants that will give you the "run of your teeth," for a fixed price; by the meal, by the day, by the week, month or year. But only *one set* of teeth; or rather, to be strictly accurate, of a double set. There at once we strike a great difference between telephones and restaurant customers. One complete set of teeth can require only a certain amount of food in a day, and only for a single individual. The amount varies widely, of course, among individuals, but the average is pretty easy to strike. But one telephone may be used by a whole family, or by a whole officeful of workers, and its capacity for use is limited practically only by the hours of the day. Ask a hotel or restaurant proprietor for a flat rate for a family or a party and he will promptly count heads and govern himself accordingly. He would never be such a fool as to offer a flat rate simply to the contracting person, without knowing how many there were in the family or party, and how many meals a day he would have to supply. But that, however, is just what the flat rate telephone manager does. A closer examination of the cooked meat illustration that my flat rate friend brings up reveals many points where the restaurant business resembles the telephone business. There enters into restaurant prices a considerable element of charge for service and of charge for quality, besides the charge for quantity. Beef is beef the country over, and does not vary greatly in price as raw material. But a portion of beef at the Waldorf-Astoria is a different proposition, in a variety of ways, from a portion of beef at the one hotel in a country town. For a *table d'hôte* dinner you will pay a dollar in one place and two dollars or three for practically the same *menu* in another. But a considerable proportion of the two or three dollar price goes for a superior service, and to meet higher rents, wages and cost of production generally. So when we come to

cooked food, where the elements of service, quality and location largely enter, the comparison with the peculiarities of the telephone service, while not exactly on all fours, is not so very difficult to demonstrate.

* * *

Coming back to the telephone service proper, it has been shown that the city telephone subscriber uses much more service than the subscriber in the small place, that he requires a greater amount of plants for the carriage of his daily traffic. It is a commonplace that costs of all kinds are higher in a city than in a small town. Rents, wages, and a variety of other items connected with the cost of living all go up with the size of the city. No practical man who lives in a city, or who, living in a country town, has visited often or seldom in a city, needs to be told that. It is one reason why Western millionaires establish themselves in New York, so that they may spend their money more quickly than they can where they made it. But apart from the two facts that the city telephone user demands the use of more plant every day than the small town subscriber, and that the city plant costs more to install and keep up than the small town plant, it also costs more to operate. If all the lines of a big city system were taken into a single exchange the line costs would be overwhelming, but the operating would be approximately the same as that of the small system, provided, of course that all the lines could be operated at a single switchboard.

* * *

A single exchange for a large city system is of course impracticable. By splitting up the area into a number of exchange districts, all interconnected by trunk lines, the line plant required for each subscriber is kept within bounds. The city subscriber gets his greater number of minute-miles just the same, but he gets them partly over his individual line and over that of his correspondent and partly over the trunk line that joins two exchanges. Now that trunk line requires operating; and here, in the operating of the trunk lines, we find another important element of the higher cost of furnishing city telephone service. Not only is the amount of line plant used daily by each subscriber much greater, but that plant requires labor in operating and complicated switching apparatus with which to operate it that are wholly absent from the single exchange system. The vast majority of city telephone messages pass through two exchanges, and to complete the line for those messages requires not only more work on the part of the original operator than to complete a local connection, but requires in addition work on the part of a special trunk operator at a special trunk switchboard. Thus the average city telephone message requires not only more line plant, but more switchboard plant and more operating labor than does the average message in a single exchange system.

The Listening-Key.

CAN YOU?

THE following gem of telephonic intelligence we cull from the *Texarana Texarkanian*:

"The Southwestern Telephone Company is replacing the small 'phones in the business houses with larger ones containing bracketed mouthpieces. It is claimed that these 'phones will give better satisfaction. What we have not been able to understand about the 'phone is that you can converse with a party hundreds of miles off with more ease and hear more distinctly than you can across the street over a wire."

This does not speak very well for the local service of Texarkana, of the *Texarkanian's* experience with the "phone" is the usual experience of telephone subscribers in that town. In the early days of long distance telephony, when the usual local telephone line was a grounded wire equipped with a Blake transmitter energized by one Leclanche cell, it was a matter of common observation that you could "converse with a party a hundred miles off with more ease and hear more distinctly," than you could "across the street over a wire," as the *Texarkanian* succinctly puts it. That was because the long distance lines were all aerial metallic circuit especially built for good talking, and the local lines used for long distance talking were also metallic circuit with special transmitters having powerful batteries.

FOREIGN CURRENTS

ONE of the English electrical papers, *Electrical Investments*, makes a feature of printing "Pioneer Stories," recounting the early experiences of those electrical engineers who took part in the early struggles of electrical engineering in Great Britain. A recent pioneer story by Mr. J. G. Lorrain, M. I. E. E., etc., etc., gives some interesting notes on the beginning of telephone work in England, in which Mr. Lorrain took an active part. The invention of the telephone was a most opportune one for Mr. Lorrain. He had just started in practice as telegraph and civil engineer in Edinburgh, and although he had a large brass plate on his door, that door seldom opened to admit a client. He earned his first fee by substituting telephones for telegraph instruments on a builder's line between the office and the works. The result was so satisfactory that Mr. Lorrain soon worked up a practice as a telephone engineer, and in a short time had all the private telegraph lines in the district under his superintendence and converted them into telephone lines.

* * *

Having thus made a start at telephone work, and having realized the possibilities of the telephone, Mr. Lorrain began to look around for exchanges. He had not heard of a telephone exchange being established in England, but knew of a telegraph exchange in Glasgow, to which a large number of Glasgow merchants and manufacturers were subscribers, communicating with each other by means of Wheatstone A. B. C. instruments. A concern called the Telephone Company, Limited, had been founded in London by Colonel W. H. Reynolds, an American, to exploit the Bell patents, and Mr. Lorrain and some friends endeavored to get a license from this company to establish a telephone exchange in Edinburgh. The manager of the Telephone Company, Limited, had other ideas, however, and said that his directors did not believe in a telephone exchange as it would spoil the telephone business! His theory was that in a telephone exchange each subscriber would buy only one set of instruments, whereas if the subscribers went in for private lines they would require to buy at least two sets of instruments for each line. This highly enterprising and far-seeing spirit naturally did not long remain manager of the Telephone Company, Limited.

* * *

A little later Mr. Lorrain found that some of the directors of the Telephone Company were alive to the advantages of telephone exchanges, but he failed to make any real progress in the matter until the arrival in England of Mr. Gardiner G. Hubbard, the father-in-law of Professor Bell. Mr. Hubbard had taken over some Standard switchboards, and the first Blake transmitters seen in England. He had explained to the directors of the Telephone Company the advantages of telephone exchanges, such as were already at work in America, and Mr. Lorrain was sent for as his previous agitation in the matter indicated him as the proper man to start the first exchange in England. The Telephone Company had a very small working capital, not an unknown condition in telephone circles even in these days, and Mr. Lorrain was able to make very good terms for himself, by agreeing to take a certain amount of risk. He obtained a concession for Manchester and 35 miles around, on condition that he put up \$7,500 on the experiment, and formed a company within six months.

* * *

Here let Mr. Lorrain speak for himself as here comes a story of pioneering that will interest many Independent telephone men, and no doubt touch a responsive chord in the breast of many a pioneer.

"I then entered into a partnership with Mr. J. D. Tracy, a connection of Mr. Hubbard's, who had had some experience in America of telephone exchanges from a business point of view; and we set out for Manchester with one of the two switchboards to establish the first exchange.

"One of the minor points determined upon before starting, which may be of interest to recall now, was the annual subscription to be charged. This was fixed at \$100, on my recommendation, 'in order that we might have our capital expenditure back within the first year,' and this subscription was adopted in the exchanges subsequently formed. We had no data to go upon, but the thing worked out well in practice, as we found that this sum, which was payable in advance, was quite sufficient to meet the capital expenditure on each subscriber's line.

"Thus the subscribers found the capital for building their own lines; and as a matter of fact I never had to put up more than \$400 of my \$7,500. Here it may be remarked that the cost of the first lines is always much less than the cost of later ones, and that the working expenses increase with the number of subscribers.

"We were greatly assisted in forming the Manchester exchange by introductions from Mr. Charles P. Henderson, a partner in the firm of Messrs. G. and R. Dewhurst; and we obtained about twenty subscribers in the first week. At this kind of work Mr. Tracy was very proficient. His method was to walk into an office and produce a copy of the list of subscribers to the exchange in Richmond, Virginia. The front cover of this list bore an amusing illustration of a parrot asking for a 'cracker' through the telephone. Mr. Tracy was generally asked what a cracker was (in England a 'cracker' is a 'biscuit'); and that led him on to some fine American telephone stories, and he generally succeeded in booking his man."

* * *

There are some interesting pointers there for pioneer telephone men even in these days when the telephone business is quite a different proposition from what it was at the time when Mr. Lorrain did his pioneering. The idea of charging a rate which would repay the capital within the first year was a delightfully bold and simple one, and all the bolder and simpler because it is the practice in England to make telephone rates payable yearly in advance. This explains why Mr. Lorrain did not have to fork out in cash much more than a tenth of the capital he guaranteed. His remark to the effect that the cost of the first lines is always much less than the cost of the later ones and that the working expenses (meaning the average working expenses per line) increase with the number of subscribers is also worthy of careful entry in the mental note-book of the present day telephone pioneer.

* * *

We will let Mr. Lorrain continue his story in his own words.

"This—the Manchester exchange—was the first telephone exchange in Great Britain, and indeed in Europe. The switching apparatus consisted of a Williams "Standard" switchboard, as it was called, and a separate operating table. Two operators were required to work 75 lines. One sat at the table to receive the calls and shouted them out to the other operator who plugged the lines together at the switchboard. The noise in a switch room fitted with a number of such operating tables may be imagined.

* * *

The following portion of Mr. Lorrain's interesting memoirs bears so nearly on present day conditions that it seems a pity to condense, so let him speak again in the first person.

"Another plan adopted in Edinburgh was forced upon us by the large number of would-be subscribers who objected to pay \$100 a year, but were quite willing to pay \$50. To suit these subscribers we started what we called district lines, such as have been recently introduced by the General Post Office and the National Telephone Company in London under the name of party lines. We offered our subscribers the option of having an individual line to themselves and paying \$100 a year, sharing a line with another subscriber and paying \$75 a year, or sharing it with two others and paying \$50 a year. This proved a successful draw, for we got a large number of subscribers at \$50.

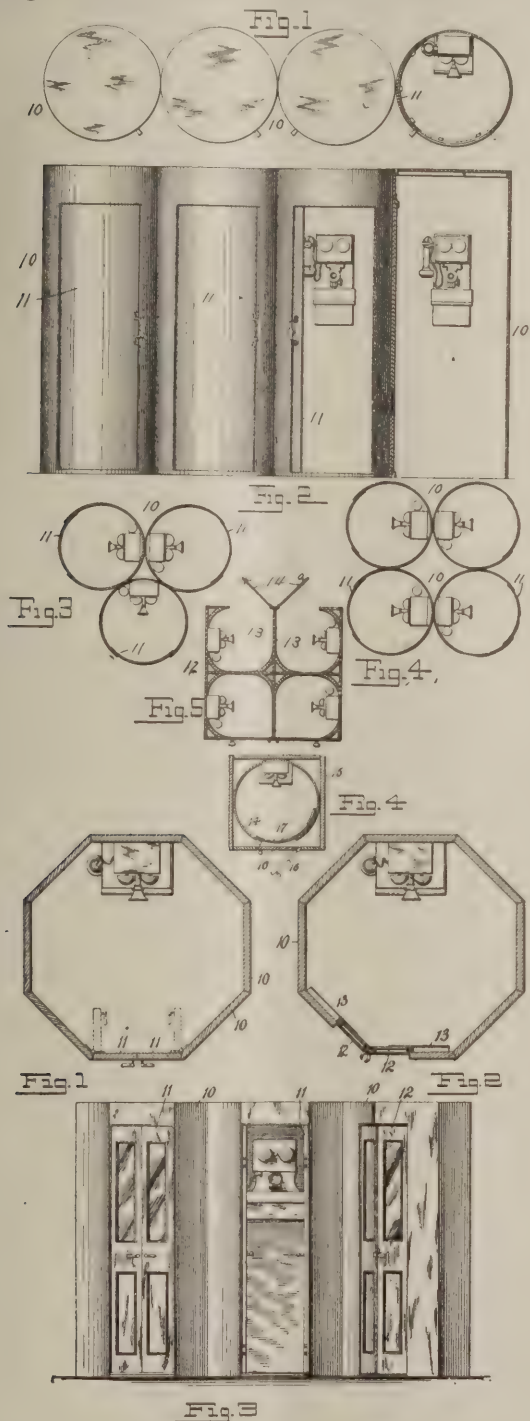
"We soon found, however, that the district line system was likely to prove very injurious to our reputation, so that we had to use it merely for the purpose of educating our \$50 subscribers into taking individual lines at \$100. What we did was to give each party subscriber a line to himself, reserving to ourselves the right to put two more subscribers on his line as soon as it suited us to do so. We took care, however, to leave his line untouched until we saw from the number of calls he made that his telephone was of great advantage to him. We then put a similar subscriber on his line, with the result that he, accustomed to having an individual line, soon became frantic when he found that he could not always speak when he wanted to, and that his bell was always ringing when his co-subscriber made a call.

"This policy proved so successful that the \$50 subscriber, rather than make matters worse by having a third subscriber put on his line, usually preferred to pay the difference and be restored to an individual line."

The Arrestor.

Patents

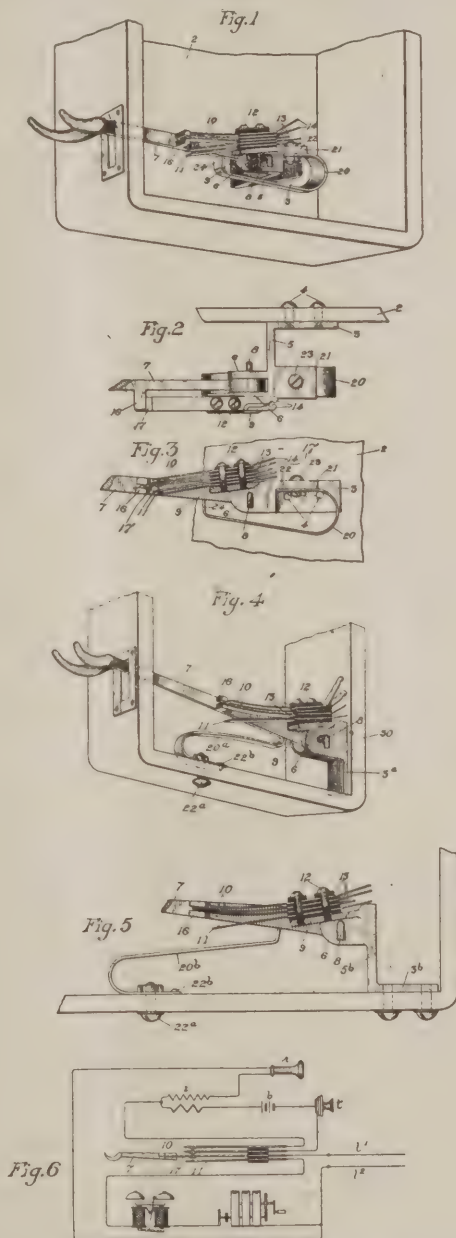
Frank Leo Tufts, of New York, takes out two patents (Nos. 704,986 and 704,987, July 15, 1902) on telephone booths. The booths are of cylindrical or polygonal form, the best results being attained by a cylindrical booth inclosed in a case, which may be rectangular. The inventor has discovered that the difficulty of preventing overhearing between the adjacent booths in a group is



due to the sounding-board effect of flat sides, by which the sound waves are transmitted from one booth to another. A cylindrical booth deflects the sound waves and prevents their transmission to the exterior. The second patent is due to the discovery by experiment that certain notes are transmitted by the cylindrical

form and certain others by the flat sided booth, and that most tones are kept within the booth if it is made octagonal or polygonal in shape as shown in the drawings of the second patent. The arrangement considered to give the greatest privacy is that shown in Fig 4, a circular booth within a rectangular or polygonal shell, the rectangular form being shown. The inventor claimed that the booth is especially designed for use in close proximity to others, so that for economy of space a group of booths can be arranged as usual, and yet a person in one cannot hear the conversation in an adjoining one.

W. W. Dean, of Chicago, patents (No. 704,697, July 15, 1902) and assigns to the Kellogg Switchboard and Supply Company. a telephone hook-switch of novel design. The essence of the invention is the use of contact springs insulated from the hook and controlled by the movements of the hook through a master spring which engages in a forked lug on the hook. Further advantages claimed are that the whole apparatus is mounted on one metal bracket and is not liable to be deranged by swelling, shrinking or warping of the case, that loss of efficiency through poor



contacts is eliminated by not using the hook itself as a conductor, and that the number of springs may be varied to suit any circuit combination. This feature is illustrated by the drawings as the different forms shown have different numbers of contact springs. The drawings illustrate the device so clearly that no description is required. The contact springs 10, 11, etc., are mounted on the same bracket as the hook and the master-spring 17, longer than the others, engages in the slotted lug 16 on the hook 7. When the hook rises 17 is separated from the lower springs and presses the upper springs together.



Legal

PHILADELPHIA, PA.—The Keystone Telephone Company has been made defendant in another equity suit brought by the Western Electric Company, of Illinois. Charles E. Wilson, manager of the Keystone Company, is made co-defendant in the present action, as he was in the former, which is still pending. The first suit was based upon an alleged infringement by the Keystone Company of patents for multiple switchboards and devices for them. In the suit just filed the defendant company is asked to be enjoined from using testing apparatus for multiple switchboards, patented by Charles E. Scribner, and said to be owned by the Western Electric Company through an assignment from Scribner. During the argument on the application for an injunction before Judge Dallas last April counsel for the Western Electric Company tacitly admitted that the Bell Telephone Company was back of the proceedings, as it was the largest purchaser of supplies from the Western Electric Company, and was also in a position to furnish telephonic service to all who might desire it in this city.

Financial

PASADENA, CAL.—The capital stock of the Home Telephone Company has been increased from \$500,000 to \$3,000,000. A certificate to that effect has been filed with the County Clerk. J. M. C. Marble is president of the company.

SIOUX CITY, IA.—The Sioux Valley Telephone Company, of Cherokee, has given notice to the Secretary of State of an intention to issue \$25,000 of preferred stock, in addition to the same amount of common stock.

BOSTON, MASS.—In accordance with a vote passed at the annual meeting of the stockholders of the Michigan Telephone Company the treasurer has submitted a report covering the operations and financial condition of the company for the year ended Dec. 31, 1901, and for the five months ended May 31, 1902. The statement of earnings for the year ended Dec. 31 shows: Gross earnings, \$1,321,681; operating expenses, \$1,621,050; deficit for the year, \$292,369. Earnings for the five months ended May 31 show: Gross earnings, \$621,455; operating expenses, \$688,151; net deficit, \$66,696.

GRAND RAPIDS, MICH.—E. B. Fisher has returned from Muskegon where he attended the annual meeting of the Muskegon Citizens Telephone Company, of which he is one of the directors, representing the large block of stock in the Muskegon Company held by members of the Citizens' Company of this city. The annual reports submitted were very satisfactory, showing 915 telephones in service in Muskegon, an increase of 151 in the past twelve months. The regular semi-annual dividend of 4 per cent. was declared and all the old officers and directors re-elected as follows: President, Thomas Hume; vice-president, Dr. W. B. King; treasurer, L. B. Smith; secretary, W. R. Mann; manager, William Robinson. The directors are Messrs. Hume, King and Smith and J. G. Emery, Thomas Monroe, C. H. Hills and E. B. Fisher.

HARRISONVILLE, MO.—The capital stock of the Cass County Telephone Company has been increased from \$2,000 to \$20,000.

BINGHAMTON, N. Y.—The capital stock of the Binghamton Telephone Company has been increased from \$500,000 to \$600,000.

CHARDON, O.—At a recent meeting of the Chardon Telephone Company the capital stock was increased from \$10,000 to \$25,000. O. Pomeroy was elected president, and W. C. Parsons, secretary.

CLEVELAND, O.—Directors of the United States Telephone Company held a meeting recently to vote an increase of the capital stock so the management can carry out plans for enlarging the company's business. The additional stock will be subscribed for by the various Independent companies that are connected with the United States Company. The company made a phenomenal showing for May, its earnings increasing in a surprising manner, as shown below:

	May, 1902.	May, 1901.
Gross earnings.....	\$24,491.76	\$11,926.39
Expenses	12,848.97	7,287.36
Balance	\$11,642.79	\$4,639.03
Interest	7,770.83	4,166.66
Surplus	\$3,871.96	\$472.37

URBANA, O.—The Urbana Telephone Company has increased its capital stock from \$50,000 to \$100,000.

CLEARFIELD, PA.—The capital stock of the Clearfield Telephone Company has been increased to \$200,000.

PETERSBURG, VA.—The board of directors of the Mutual Telephone Company have declared a semi-annual dividend of 3 per cent.

PRAIRIE DU CHIEN, WIS.—The capital stock of the Union Telephone Company, of this place, has been increased from \$1,000 to \$5,000. M. Menger is president of the company and S. N. Bisbee, secretary.

New Companies

SAN, FRANCISCO, CAL.—The Sunset Telephone and Telegraph Company has been incorporated, with a capital stock of \$3,000,000. Directors: Geo. S. Ladd, John I. Sabin and others of San Francisco. The company, with headquarters in San Francisco, will build and operate telephone lines in the States of California, Oregon, Nevada, Washington, Utah and Arizona.

CHICAGO, ILL.—The Union Electric Telephone & Telegraph Company of Chicago has been organized, with a capital stock of \$400,000.

INDIANAPOLIS, IND.—Articles of incorporation have been filed here for the Palmyra Independent Telephone Company, of Knox County, with a capital stock of \$14,000. Directors: Robert B. Patterson, John G. Dreiman, Edward E. Shaw, J. W. Alton, V. S. Manning, Lester S. Root and C. W. Wilson.

SYRIA, IND.—The Syria and Orleans Telephone Company, of Orange County, has been incorporated; capital stock, \$500. Directors: Aaron Pickens, James L. Noblitt, Henry McCoy, John R. Gifford, A. L. Gallion, John M. Frost and H. S. Noblitt.

KIRON, IA.—The Kiron Telephone Company has been incorporated, with a capital stock of \$8,000.

LACELLE, IA.—The Weldon, Lacelle and Osceola Telephone Company, of Lacelle, has been incorporated, with a capital stock of \$910.

MITCHELLVILLE, IA.—The Mitchellville Telephone Company has been incorporated, with a capital stock of \$10,000 by J. B. Uhl, B. R. Patterson and S. J. Oldfield, all of Mitchellville.

PITZER, IA.—The Farmers' Mutual Telephone Company, of Dexter, with headquarters here, has been incorporated, with \$10,000 capital stock. N. Angle, president; J. W. Sawhill, secretary.

HAYS CITY, KAN.—Justice Bissing has circulated a petition asking for subscribers for a telephone system which he intends to install. The agreement is to pay for the telephones at the rate of \$1 for residence and \$1.50 for business. The City Council has granted Mr. Bissing a franchise to put in the system.

HOPKINSVILLE, KY.—A movement is on foot for the organization of a new telephone company. M. C. Forbes, R. E. Cooper and other capitalists are interested in the matter, and it will be pushed if the City Council does not grant a new twenty-year franchise to the Cumberland Telephone and Telegraph Company. In any case the parties at the head of the proposed new enterprise expect to purchase another franchise and construct a competing line. This new organization will be known as the Home Telephone Company, and will be incorporated with \$30,000 capital stock.

PORTLAND, ME.—The Stone Telegraph and Telephone Company has been incorporated, with a capital stock of \$10,000,000. The promoters are Alexander Porter Browne and Brainerd Judkins, of Boston; John Stone, of Cambridge, and John W. Anderson, A. G. Berry, M. Warren and Wm. M. Bradley, of Portland.

PORTLAND, ME.—The Superior Automatic Telephone Company has been organized here, with a capital stock of \$5,000,000, of which nothing is paid in. The president is John G. Robinson, of Melrose, Mass., and the treasurer is Hayes Lougee, of Boston.

SUNDERLAND, MASS.—A local telephone company has been formed here, with Wm. F. Campbell as manager. The charges are \$12 per year.

DIAMONDALE, MICH.—The Diamondale Telephone Company has been incorporated, with a capital stock of \$5,000, to conduct an Independent exchange at Diamondale and vicinity.

KIMBALL, MINN.—The Kimball-Maine Prairie Telephone Company has been incorporated, with a capital stock of \$1,000. Incorporators: D. B.

THE WEEK'S MESSAGES *Continued*

Stanley, W. F. Wardeman, W. H. French, Maine Prairie; P. Partridge, Fair Haven; Louis Wieber, M. Sherwood and Geo. E. Sherwood, Kimball.

TARKO, MO.—Mr. W. A. Smith, of Pickering, Mo., addressed about 100 farmers recently on the benefit and economy of mutual telephones. He gave the farmers much valuable information concerning these lines and the cost of them. About thirty paid \$1 each for membership and buying a switchboard. A central organization was then formed by electing Chris Shaum, president; L. P. Coe, vice-president; J. E. Johnson, secretary, and W. F. Baker, treasurer. These officers were instructed to push the work and to purchase a switchboard, poles, wires, etc. They were also authorized to interest the town and business men in this enterprise.

COZAD, NEB.—The Cozad Mutual Telephone Company has been incorporated and has secured a franchise. The company is composed of a large majority of the business men of Cozad and a number of other citizens. The capital stock is \$2,000. Several country lines will be built by the farmers of the surrounding country, and these have been offered free use of the central office of the Cozad Company.

YORK, NEB.—The York Telephone Company has been incorporated, with a capital stock of \$50,000. Incorporators: J. N. Straight, E. A. Wells and C. N. Bladen.

ALBANY, N. Y.—Articles of incorporation have been filed here for the Crosby & Barrington Telephone Company, of Yates County; capital stock, \$5,000. Directors: C. E. Guile and H. S. Fullagar, of Penn Yan, and A. P. Mortimer, of Dundee.

ALBION, N. Y.—The Rural District Telephone Company has been incorporated; capital stock, \$25,000. Directors: Wm. E. Peck, Frank Grantier and Frederick C. Lincoln, of Buffalo.

PATTERSONVILLE, N. Y.—The Pattersonville Telephone Company has been incorporated. It is proposed to build and operate telephone lines from Pattersonville, connecting Scotch Church, Rotterdam Junction, Amsterdam and Schenectady, and farm houses located in the counties of Montgomery and Schenectady. The capital stock is placed at \$3,200. The directors are: W. James Smeallie, John M. Conover, Alfred M. Dougall, Daniel Dougall, Hugh Dougall, I. Frank Patterson, John A. Ennis, Alexander Ennis and Elmer E. Dockstader, all of Pattersonville.

EAST SPRINGFIELD, O.—The East Springfield Telephone Company has been incorporated, with a capital stock of \$6,000, by H. L. Fiscus and others.

KENTON, O.—The Kenton Construction Company has been organized, with a capital stock of \$10,000, to build telephone plants.

MT. BLANCHARD, O.—The Peoples' Telephone Company is the title under which a telephone company owning and operating exchanges in Mt. Blanchard, Arlington, Jewera, Wharton and Forest, has been incorporated. The capital stock is \$25,000, over \$15,000 of which has already been subscribed. The office of the company is located at Mt. Blanchard, and the officers are as follows: President, J. M. Crawford, Columbus Grove; vice-president, Milton May, Mt. Blanchard; secretary-treasurer, Nora Sampson; manager, Oscar Wise. Directors: J. M. Crawford, B. F. Siles, Columbus Grove; Oscar Wise, Milton May and William Bishop, Mt. Blanchard. The Peoples' Telephone Company originated about two years ago when Oscar Wise put in an exchange at Mt. Blanchard. He kept extending the service until it included the towns named above, with a total of 478 telephones and over 100 miles of toll lines. To better handle the business Mr. Wise decided to form a company, which he did, and the prospects for a substantial increase in business are most flattering. The local part of the county and farmers all along the lines are connected.

PHILADELPHIA, PA.—A charter has been secured at Dover, Del., by the Hughes Telephone Manufacturing Company, of this city, to manufacture telephone supplies; capital, \$100,000.

TUNKHANNOCK, PA.—The Tunkhannock and Wyoming Valley Telephone Company has been incorporated to operate in Centre, Westmoreland and Wyoming counties; capital, \$2,000.

PECAN GAP, TEXAS.—The North Texas Telephone Company, of Pecan Gap, has been incorporated, with a capital stock of \$5,000, by C. C. Cockrell, W. R. James and J. H. Sardin.

ROANOKE, VA.—A charter has been granted to the Wythe Mutual Telephone Company, of Wythe County. They propose to greatly reduce rates.

SHERRARD, W. VA.—The D. M. Garvin Company, of Sherrard, has been organized to operate telegraph and telephone companies; capital stock, \$25,000, all of which amount has been subscribed and \$2,500 has been paid. Incorporators: D. M. Garvin, T. B. Cox, Mattie E. Pierce and Margaret H. Garvin, of Sherrard, and T. M. Garvin, of Wheeling.

Elections

SAVANNAH, GA.—The Georgia Telephone and Telegraph Company held a meeting here recently. The stockholders elected the following board of directors: W. A. Bisbee, J. H. Estill, W. W. Mackall, Jacob Paulsen, Leopold Adler and H. P. Smart. The directors then met and elected the following officers: President, W. A. Bisbee; vice-president, J. H. Estill; chair-

man of board, W. W. Mackall; secretary, W. V. Davis; treasurer, C. S. Kenyon. A semi-annual dividend of 3 per cent has been declared.

GRUNDY, IA.—The annual meeting of the Grundy County Mutual Telephone Company has been held. The secretary's report showed the company to be in splendid condition. The plant which was put in at a cost of \$4,500 now invoices \$6,000 with less than \$1,500 indebtedness, more than half of which will be liquidated by January 1, 1903. The directory was re-elected and is as follows: Fred. J. Frost, F. W. Reisinger, R. M. Finlayson, H. M. Bigelow, E. H. Dodd, W. R. Laybourn and Phil Leibsohn.

GRAND RAPIDS, MICH.—At the annual meeting of the stockholders of the Citizens' Telephone Company, the officers and directors were unanimously re-elected as follows: President, Charles F. Rood; vice-president, Edward Fitzgerald; secretary, E. B. Fisher; treasurer, William J. Stuart; directors, Philip Graham, Robert D. Graham, C. E. Perkins, L. J. Rindge, E. G. Studley and J. B. Ware, of Detroit. The report of the secretary showed that on July 1 the company's system contained 10,496 telephones, against 6,963 a year ago, a gain of 3,533, or 51 per cent. during the year. Of this increase 935 were city subscribers. The gross income of the company was \$198,110.98, out of which \$56,804.60 was paid in dividends and \$31,000 added to the surplus after paying the running expenses and cost of maintenance of the system. The earnings of the last quarter of the year were, in round numbers, \$16,000 more than for the first quarter. The reports showed that exchanges were established during the year at Ionia, Belding, Diamonddale, Sparta, Freeport, Grandville, Cascade Springs and Greenville, and are now being established at Empire, Kingsley and Tustin, while a franchise has been secured at Portland. The total amount of the \$1,000,000 capital stock subscribed is \$847,000, of which about \$147,000 was taken during the year, leaving \$153,000 still unsold.

PATERSON, N. J.—At the annual meeting of the stockholders of the Paterson, Passaic and Suburban Telephone Company, the following directors were elected for the ensuing year: C. W. Kline, George A. Post, Samuel Sheldon, Robert Atherton, James W. Lindsay, Wayne Dumont, Barker Gummere, Jr., E. C. Stokes, Walter Bamford, A. W. Worstall, F. A. Demarest, C. A. Starr and Robert Gaede. It was decided, instead of leasing the company to the Inter-State Company of Trenton, to continue to operate the local system independently as in the past.

ANDOVER, N. Y.—The directors of the Alleghany Mutual Telephone Company at a recent meeting decided to keep the central at Fowler's another year. Mr. Fowler will be general manager of the system. W. B. Bundy resigned as president and Mack Green was elected to perform the duties of that office. An assessment of \$3.50 per share was voted, which will a little more than cover all the outstanding obligations of the company.

BINGHAMTON, N. Y.—The plant of the Binghamton Telephone Company has been turned over to the owners by the construction company that built it, and the following directors have been elected for the coming year: George C. Bayless, Thomas B. Crary, and James H. Roberts, of this city; Edward Davis, of Philadelphia; E. M. Leader and W. A. P. Thompson, of Shamokin, Pa., and G. R. VanAllen, of Northumberland, Pa. The old officers were elected. They are George C. Bayless, president; Edward Davis, vice-president; Thomas B. Crary, treasurer, and James H. Roberts, secretary.

JAMESTOWN, N. Y.—At the annual meeting of the stockholders of the Home Telephone Company, held recently, directors were elected as follows: Jules Vautrot, Jr., Geo. B. Devoe, Chas. B. Selby, of Warren, O.; Chas. W. Devoe, of Orwell, O.; E. P. Putnam, M. M. Skiff and P. H. Hoyt, of Jamestown, N. Y. At the close of the stockholders' meeting the directors elected the following officers: President, Jules Vautrot, Jr.; vice-president, Peter H. Hoyt; secretary, Chas. B. Selby; treasurer, M. M. Skiff. Superintendent Lane was retained in his position and no changes in the office force of the company will result from the meeting.

CLEARFIELD, PA.—The following have been elected officers of the Clearfield Telephone Company: President, S. Bell; secretary, H. S. White-man; treasurer, A. L. Austin. R. M. Fuller has been appointed engineer, in charge of construction.

STAUNTON, VA.—At the annual meeting of the Long-Distance Telephone Company the following officers were elected: N. C. Watts, president, treasurer and general manager; William Patrick, vice-president, and G. A. Gully, secretary; directors, N. C. Watts, William Patrick, S. R. Curtis, J. A. Sproul and J. T. Carr.

Franchises

ALAMEDA, CAL.—The Independent Telephone and Telegraph Company, of which Senator E. K. Taylor is one of the directors, has filed an application for a franchise. The company has secured a franchise in Oakland.

SALIDA, COL.—The Colorado Telephone Company has received a franchise to operate here. The company will probably construct a line from Cripple Creek to this place.

CHIHUAHUA, MEX.—Mrs. Anna McElroy Brett, of the Brett Telephone Company, El Paso, Tex., has been given a franchise at Chihuahua,

THE WEEK'S MESSAGES *Continued.*

and will commence building the plant immediately. The plant will have some Cleveland capital in it, and will be connected with a lot of long-distance telephone lines, already in operation.

BUFFALO LAKE, MINN.—A franchise has been granted to the Buffalo Lake Telephone Exchange Company.

HAMILTON, N. Y.—The Modern Telephone Company has received a charter to operate in Hamilton.

ONEIDA, N. Y.—The International Telephone Company of America has asked for a franchise to string wires in this city. The company agrees, in consideration of the franchise, to have 1,200 telephones in operation within eighteen months. It also agrees to use an underground cable system. There are at present six telephone companies operating here, the Central New York Telephone and Telegraph, the American Bell Telephone, the Oneida Automatic Telephone, the Rome Home Telephone and the Columbia Long Distance Telephone companies.

TORONTO, S. D.—Through the energy of C. P. Leonard, this town will have a local telephone system in the near future. A franchise has been granted by the Town Board. Work on the system will begin at once, and it is expected that it will be completed and placed in operation Aug. 1.

Underground

PUEBLO, COL.—The Colorado Telephone Company has asked for an extension of its franchise for thirteen years. If granted, it will mean the expenditure in Pueblo in the near future of over \$125,000 and the placing of all the telephone wires in the city underground. In the cities of Colorado Springs and Denver the extension of the franchise of the company has been granted and the wires have already been put under ground.

PRINCETON, N. J.—All wires of the telephone, telegraph and electric lighting companies operating here will soon be placed in underground conduits.

FARGO, N. D.—In accordance with an ordinance passed by the City Council, the Northwestern Telephone Company is making excavations for underground conduits for the telephone system in the business part of the city. This involves underground pipes for a distance of about forty blocks and will do away with hundreds of telephone poles in the heart of the city, besides the numerous unsightly networks of wires. It involves the expenditure of several thousands of dollars to make the improvement, but in the long run the company feels certain it will be a profitable investment. The company has also completed plans for a large exchange. The structure will cost in the neighborhood of \$25,000 and will be thoroughly equipped with the most modern appliances.

Competition

SUISUN, CAL.—The Sunset Telephone Company has awakened to the fact that the barbed-wire telephone systems which have been and are being established in this county are competitors worthy of notice. These barbed-wire lines have been extended all over eastern and northern Solano County, in the vicinity of Dixon and Rio Vista, and some of the local companies which have the regulation pole lines now offer very low rates of exchange. The barbed wire system at Rio Vista is preparing to lay a cable across the Sacramento River, and bring residents of Sacramento County into communication with the people on this side. As there are no charges after the first cost of putting in the instruments, the service is very economical and convenient, and a majority of the residents in each locality mentioned are on the lines. To meet this growing popularity and competition the Sunset Company has had agents in Dixon and Davisville this week offering to install instruments at farms at a monthly rental of 50 cents, which is one-third of the regular price. In addition, they offer to transmit messages over the barbed-wire system at a rate of 5 cents each. The rural systems already installed have proven so satisfactory, convenient and economical, however, that few were found who would agree to change.

PEORIA, ILL.—The Interstate Telephone Company, recently incorporated, has issued to the American Trust Company a trust deed whereby it may issue bonds to refund its outstanding indebtedness and to complete plans already outlined looking toward the construction of its numerous projected telephone lines. The amount to which the company is authorized to issue bonds, under the deed, is \$50,000,000, which shows that it will probably prove to be a great rival to the Bell Company. The paper has previously been filed in Sangamon, Whiteside and Will counties, and will be sent on from county to county until it is a matter of record in all the counties where they have franchises. The Interstate Telephone Company recently absorbed the franchise given several gentlemen and known as the Evans Telephone Company, and it would seem that inasmuch as they have financed the company the work of installing the plant in this city will be begun within a very short time. The same company is operating plants in many cities and counties of the State, and expects to connect with all of the Independent lines in the State and elsewhere.

PADUCAH, KY.—The directors of the new People's Telephone Company at a recent meeting let the contracts for building the line in Paducah, work to begin at once. It means the investment of about \$100,000,

and will bring the home people in competition with the Cumberland Telephone and Telegraph Company, which has had a monopoly for quite a while.

BOWLING GREEN, O.—The Independent telephone lines in Wood County, after having connected up pretty nearly every town in the county, have announced a flat rate to all points in the county of 10 cents. This means a cut of 25 cents in some instances and a liberal cut in many other cases. It is expected that the Bell Company will meet this rate.

SHAMOKIN, PA.—The United Telephone and Telegraph Company has recently completed an extension to Harrisburg. Gradually this company is extending its lines and has become an active rival of the Bell especially in this region. It is expected that in a short time, a connection to Philadelphia will be finished and also the Maryland lines will be extended so as to join with the Pennsylvania.

BEEVILLE, TEX.—Beeville now has a new telephone company, the Rural, owned by the Jennie Atchley Apiaries, which is putting in a local exchange and extending its lines to all the post offices in Bee and adjoining counties, as well as to most of the ranches and principal farms whose owners do their trading in Beeville. The new company proposes to compete with the older companies by offering the subscribers a lower rate than they have been getting heretofore.

SEATTLE, WASH.—A lively 'fight' for the monopoly of the telephone business in West Seattle is in progress. Ever since the inhabitants of the suburb voted to incorporate, a telephone service has been one of the crying needs of the community. Up to very recently it has appeared that the Sunset Telephone and Telegraph Company had a monopoly of the town. But there has been a change. A prominent city official has circulated contracts among the residents of the suburb for the installation of a system by the Independent Telephone Company of Seattle, and that corporation has formally applied to the West Seattle Council for a telephone franchise. The application was laid over for a week. When it comes up there will undoubtedly be a lively fight, since the Sunset Company's application has been pending for weeks. The chances are said to be greatly in favor of the success of the Independent Company. The Chamber of Commerce has taken vigorous exception to the telephone service at present afforded the citizens of Seattle by the Sunset Telephone Company. C. E. Fowler said that he had found the service the past two weeks particularly exasperating and suggested that the business men of the city should refuse to pay telephone rentals until conditions were bettered.

Combinations

CARBONDALE, ILL.—The telephone system of this city has been sold by D. M. Parkinson and J. B. Bundy, to a corporation known as the Carbondale Telephone Company. The consideration was \$15,000.

NORWALK, O.—The Wakeman Mutual Telephone Company has been absorbed by the Local Telephone Company of this place. This gives Wakeman connection with New London, Berlin Heights, Huron County, and with the United States Telephone Company for outside cities. A big exchange and a farmers' line to extend three miles into the country around, will be established.

Construction

DE KALB, ILL.—The DeKalb County Telephone Company is putting in new overhead and underground cable. This company is spending thousands of dollars in DeKalb this year in enlarging and improving the service.

CASCADE, IA.—The Standard Telephone Company is extending a line to Cedar Rapids.

MAXWELL, IA.—L. Gillespie, of Nevada, is here installing the new switchboard for the Maxwell Telephone Company. The company has orders for a large number of new telephones, and several farmers' lines are waiting the installation of the new addition to the switchboard to connect with the central office.

OELWEIN, IA.—The Cedar Valley Telephone Company has material on the ground for its new line between Oelwein and Minkler and the building of it will be commenced immediately.

ELIZABETHTOWN, KY.—The Home Telephone Company, of Louisville, will soon give Elizabethtown another connection with Louisville and other points.

LOUISVILLE, KY.—John A. Harrison, manager for this county of the East Tennessee Telephone Company, is making preparations to extend his lines from this place to Camden, Van Buren, Van Dyke and Gudgel, making about eighteen miles more of new routes.

SALT LICK, KY.—A telephone line is being constructed from here to Yale, thus connecting with Owingsville.

FARMERVILLE, LA.—The Camie, Cecil & Fay Telephone Company has received a new switchboard for its Farmerville office, and is now putting in a telephone exchange here.

AUGUSTA, ME.—A telephone line from Augusta to East Livermore, by way of Readfield, Fayette Mills and Fayette Corner is in process of construction.

THE WEEK'S MESSAGES Continued

SNOW HILL, MD.—The Diamond State Telephone Company, which owns the plant now in operation in Snow Hill, has leased an office and will begin work on the new exchange. The entire system will be remodelled and much improved. When the work is completed it will give Snow Hill direct connection by copper wire metallic circuit with Baltimore, Philadelphia and New York and general long-distance service.

KINGSLEY, MICH.—A telephone line is being constructed by the Citizen's Telephone Company between here and Monroe Center.

MINARD, MICH.—It is expected that a telephone line will soon be constructed between Minard and Tompkins.

AFTON, MINN.—The Consolidated Telephone and Telegraph Company is extending a telephone line from Lakeland to this place.

WINONA, MINN.—The Winona Telephone Company will shortly secure extended connections at Plainview and vicinity through the Greenwood Prairie Telephone Company, which is now building to a connection with the lines of the Winona Company at Elba.

FRANKLIN, NEB.—The Franklin Telephone Company has a force of men restringing wires about town, and in a short time will have its exchange in working order. Its line to Macon, Neb., has been completed. It has about eighty telephones on the exchange in town.

BURLINGTON, N. J.—The Standard Telephone and Telegraph Company is shortly to lay a cable under the river, between here and Bristol.

IDELL, N. J.—Idell will be connected by telephone with Baptistown, which will give connection with other towns in the county.

LITTLE YORK, N. J.—The telephone line has been extended from here to Pattenburg. A line has been staked out to Bloomsbury.

SUSSEX, N. J.—The Farmers' Telephone Company is constructing its line to Unionville and Pine Island.

CORTLAND, N. Y.—Work on the new line of the Tioughnioga Telephone Company from Cortland to Binghamton has been commenced. The line will be started from McGraw and will connect with Cortland on the poles of the Home Telephone Company's line. The poles are being placed between McGraw and Freetown. From Freetown the line will go to Marathon, and from there along the river to Binghamton. The Ithaca line will be started as soon as the Binghamton line is completed.

EAST AURORA, N. Y.—The new Haines Company is working speedily to install a second telephone system here. The poles and most of the equipment are on the ground. The company's canvassers are meeting with success, already having about fifty contracts for the service. They make no charge for service until there are 100 subscribers, the rates then to be \$9 a year for residences and \$12 for business places. It is expected the telephones will be in operation in two months.

SHERMAN, N. Y.—The Sherman Telephone Company will construct a copper circuit to Mayville and Panama for toll service. This will be met at the two places named by copper wires to Jamestown and the Lake Shore systems.

SMYRNA, N. Y.—The telephone line from here to North Otselic is nearly completed. It connects with a line from Smyrna to Sherburne.

GRAND FORKS, N. D.—The Northwestern Telephone Company has stretched another cable across the river. This cable will add 100 wires to the capacity of the company's lines.

HOPE, N. D.—The Union Telephone Company of Hope is improving its plant.

NEWARK, O.—The Independent Telephone Company of Newark has given a contract for the rebuilding of its plant at a cost of nearly \$50,000.

UTICA, O.—Utica's new telephone exchange, built by Judge Critchfield, who recently constructed similar plants at Johnstown and Croton, this county, connecting them with the Independent exchange at Newark, will be finished here in a short time. Judge Critchfield expects to get 200 subscribers in Utica and vicinity, all of whom will be connected with the Newark exchange.

POTTSTOWN, PA.—A telephone line is being constructed, and will soon be in operation between here and Pughtown.

STEELTON, PA.—A number of men have been at work on the new extension to the United Telephone and Telegraph Company's line from this place to Oberlin and Enhaut. The new extension will have connection with the Steelton exchange and is now in operation.

JACKSON, TENN.—The Home Telephone Company has commenced work on its new lines, and in the near future Jackson will have two telephone companies.

SALT LAKE CITY, UTAH.—The R. M. Bell Telephone Company has begun work on the Council-Meadows branch into the Thunder Mountain district, which will give a new and Independent line to that country. Salt Lake is now able to talk to Boise direct, as the line between Blackfoot and Hailey is completed. The towns of Stockton and St. Johns in Tooele County are being connected by telephone. All the new material for reconstruction in Salt Lake has been shipped, so that the new switchboard will be set up and in operation at the expected time.

ST. JOHNSBURY, VT.—The Citizens' Telephone Company is extending

its lines to West Concord. Forty instruments have already been subscribed for. West Waterford will also be added to the exchange in a short time, the people along the route having volunteered to erect the line. They will have all the privileges at the regular rates. At present more than 600 instruments are connected and the number is constantly increasing. Wells River will be connected during the summer from McIndoes, thus opening new connection with quite a territory in that vicinity. As only seventy miles of Independent companies' lines are now required to reach Boston it is certain that communication with that city over this line is the matter of a little time only. The Vermont Peoples' Telephone Company of Orleans County is to be organized into a stock company. This company has 480 instruments and is connected with every post office in the county. A complete metallic circuit will be put in this summer.

FLOYD, VA.—The Floyd Telephone Company, under the supervision of S. R. Brame, manager, is extending its lines into almost every neighborhood in the county. There will be eight long lines and several short ones in all, including more than 150 miles of wire, with 50 telephones in use in Floyd. The system, when completed, will connect by direct lines with Christiansburg, Radford, Snowville, Hillsville, Rocky Mount and Roanoke City.

SUNNYSIDE, WASH.—The co-operative telephone line, which has been in operation in Sunnyside and vicinity for a year or more, is to be extended to North Yakima. Those behind the enterprise believe they can get the service cheaper than is furnished by the other company, and residents along the line have been induced to join them. The line will be completed to North Yakima by fall.

Miscellaneous

FLAGSTAFF, ARIZ.—Charles Canall, of the long-distance telephone line, is here making arrangements to connect a number of business houses with the long distance. It is his intention to extend the line from Williams to Ash Fork, where he will connect with the telephone lines to Prescott, Jerome, Phoenix and other Southern Arizona towns.

REDLANDS, CAL.—The franchise of the Sunset Telephone Company expired at the end of last month, since which time the company has been operating its lines in this city without a franchise. Attorney William Dunn of Los Angeles, the company's legal adviser, states that under the provisions of a law passed by the last legislature, the company is not required to have a franchise, but City Attorney Leonard takes issue with him on that point and maintains that the telephone people must have a franchise. Both the city trustees and the attorneys of the telephone company have, at different times, drawn up ordinances, none of which were acceptable to both parties.

MILFORD, DEL.—Telephone connection has been established between Milford and Slaughter Beach.

INDIANAPOLIS, IND.—The new branch exchange of the New Telephone Company has been opened. Over 800 subscribers will be connected directly with this exchange and the company has assured them the service will be the most prompt and efficient possible. The switchboard has a capacity of 1,800 lines.

DES MOINES, IA.—The Executive Council of the State has fixed the assessment of 700 telephone and telegraph companies' properties for taxation this year, whereas last year there were but 280 of them to assess. This shows the growth of the Independent telephone business in Iowa. Reports from the office of the Secretary of State are to the effect that the increase continues to make itself manifest in the new articles of incorporation filed in that office and which authorize new concerns to begin business. A tendency to consolidation among the larger telephone lines has begun to manifest itself. An association has been formed which answers the purpose of a practical, business association. Under it the State is divided into districts for toll-line operation and there are no elements of cut-throat competition among the concerns. A large number of small, local mutual concerns are doing business on the community plan.

MILTON, IA.—A meeting of the rural telephone lines in Milton and vicinity has been held here for the purpose of securing rates from the Milton Telephone Company to connect on their switchboard.

RIVERSIDE, IA.—The Union Dale Telephone Company has three new lines in operation here, one about five miles long, northeast of town, one about four miles long, east, and another line southeast of the same length as the east line.

SHENANDOAH, IA.—C. A. Besser, representing the Independent Mutual Telephone Company, of this place, is canvassing for subscribers. Between sixty and seventy of the leading business firms in the town are already on the list. The installing of this system will enable citizens of Shenandoah to talk with from 600 to 800, possibly 1,000 subscribers, who will have connections with the Shenandoah exchange. In addition will be a free service over all the farmer lines connecting with the farmer lines running into Shenandoah.

CLIFTON, KAN.—The annual meeting of the Northern Kansas Telephone Association has been held in this city. About twenty representatives from a dozen different lines were present. Many of them had sug-

THE WEEKS MESSAGES Continued

gestions to offer in the way of improvements for the various lines. Mr. O'Brien, representing the Missouri & Kansas Telephone Company, was present and gave a talk explaining the object of that company in building its toll line through this section of the country. According to his statements it is not the intention of that company to fight the Independent companies, but work with them in giving the public better telephone connections throughout the country. The officers elected for the coming year were: President, W. H. Nelson, of Smith Center; vice-president, Dr. Trice, of Clay Center; secretary, D. C. Tyler, of Clifton; treasurer, W. W. Dilworth, of Beloit. Clay Center was selected as the place for holding the next annual meeting.

PORTLAND, ME.—The Portland and Saco Electric Railway line is to be equipped with a private telephone line for the use of its officials and employees. The line will extend from the office of the Portland Railway Company, in Portland, to the office of the Biddeford & Saco Railroad, in Biddeford, and the power station. Altogether there will be about fourteen instruments. This line will be similar to lines on the Sanford & Cape Porpoise and the Lewiston, Brunswick and Bath roads. In case of accident or necessity for information from headquarters, the conductor of a car can get off at any turnout and communicate either with the Biddeford or Portland offices.

OMAHA, NEB.—The Nebraska Telephone Company has voluntarily raised the pay of its linemen from \$2.50 to \$2.75 per day.

TROY, N. Y.—The telephone line between Troy and Covert is completed and working.

WELLSVILLE, N. Y.—The Willing Telephone Company has connected its lines with the Wellsville Telephone Company.

COLUMBUS, O.—The Citizens' Telephone Company proposes to install an automatic switchboard in its Columbus office. Only ratification of the contract by the Citizens' company directors is necessary before the new system is introduced. President Henry A. Lanman says that installation of the new switchboard will entail an expenditure of \$200,000, as all subscribers would have to be provided with new instruments.

BRADLEY, S. D.—The new telephone system at this place has been completed and placed in operation. It starts off with quite a number of subscribers, and the number is being steadily increased.

PIERRE, S. D.—Frank Rowe is here from Chamberlain working on the project of the extension of his Chamberlain-Presho telephone line from Presho to this city, and is canvassing the business men of this city and Fort Pierre for encouragement in that direction. As this line would cover a large amount of range country, it would be of great convenience to both towns. If this project is carried out the next move will be the extension of the same line from Fort Pierre to Rapid City, thus connecting the Hills country with both Pierre and Chamberlain through one line.

ASHLAND, WIS.—The new Independent Telephone Company of Ashland wants long distance connections with the People's Company in Superior, and arrangements will be made to accomplish that end this season if possible. C. V. Haymaker is the president of the new company here, which recently got a franchise and has already commenced setting poles. He claims that his company will be ready to commence operating to a certain extent within three months. He broached the matter to the officials of the Superior Company, and asked for some proposition. They decided to agree to meet the Ashland people half way just as soon as that end of the line is ready to commence giving service, which will be of benefit to Superior people. It is quite possible that Ashland will, therefore, be on the list of toll stations on the People's company's exchange.

Personal

ALPENA, MICH.—Horace Cavanagh has been tendered the position of superintendent of the Alpena Mutual Telephone Company, and has already assumed his new duties. He succeeds Will G. Monaghan.

BINGHAMTON, N. Y.—Martin Withington has been appointed manager of the Binghamton Telephone Company by the board of directors. Mr. Withington represented the Eastern Electrical Construction Company of Philadelphia in the construction of the system, and acted as manager for the construction company, while the system was in process of perfection. His work has been excellent, and the appointment comes to him as a deserved recognition of his abilities.

COLUMBUS, O.—Alban J. Butler, traffic manager of the Citizens' Telephone Company of Columbus, has resigned. He is succeeded by Z. Howard, who has been with the company for some time.

TRADE NOTES

THE STANDARD VITRIFIED CONDUIT COMPANY recently incorporated with R. W. Lyle, as president and manager and B. S. Barnard, vice-president and secretary, are producing conduit of superior quality, thoroughly vitrified and salt glazed. They make them in multiple type, having newly patented interlocking features, using a key connection, which means very rapid construction and superior joints. They have the latest and one of the best equipped

clay plants for the manufacture of underground conduits in the country. It is located at South River, N. J.

Mr. R. W. Lyle resigned from the American Vitrified Conduit Co., which he established years ago. He has the knowledge acquired by thirty years' daily application to the clay manufacturing business.

Mr. B. S. Barnard was with Mr. Lyle in the American Vitrified Conduit Co., as sales manager, and his position with the trade is so thoroughly established that there is promise of a very brilliant future for the Standard Vitrified Conduit Co.

The Standard Company has secured many skilled workmen who have thorough knowledge of the manufacture of vitrified clay conduits. Most of them have been under the management of Mr. Lyle for many years. The company is excellently equipped to do a large business in multiple or single duct conduits, granting favorable prices and insuring prompt delivery.

G. M. GEST, subway contractor, has recently placed on the market a special sewer trap, designed especially for manhole use. It is equipped with an automatic backwater valve, and is self cleaning, thus doing away entirely with the old style wooden plug and other similar devices. These sewer traps are being placed on all work being done by G. M. Gest. This device is of especial interest at this time, because there seems to be a wide difference of opinion among engineers on the question of ventilating and draining the manholes to sewers. The Gest Company say that their experience has been that the best subway engineers prefer these connections to both gas and watertight, if possible. This new device has been put on the market particularly to meet this condition.

Mr. Gest has just been awarded, through his Cincinnati office, the contract for the underground conduit work of the Bell Telephone Company of Cincinnati. The new sewer trap will be used in this contract, which is for about one hundred thousand duct feet.

THE KELLOGG SWITCHBOARD AND SUPPLY COMPANY, Chicago, has just closed a contract with the Keystone Telephone Company, Philadelphia, for another switchboard. This board is for the Fourth District Exchange, and has an ultimate capacity of 7,200 lines, with 3,420 lines present equipment. Included in the contract is all necessary power apparatus, distributing frames, sneak currents, and lightning arresters. The exchange when finished, will be complete in every detail, and equipped with all the latest and most modern improvements.

THE FARR TELEPHONE & CONSTRUCTION SUPPLY COMPANY has sent out a unique advertisement. This is printed in green ink, on a very pretty white paper.

It is headed "Certificate of Guarantee," and offers a reward of \$200 to any one proving their telephones to be not as represented.

PLANTS FOR SALE

TELEPHONE PLANT FOR SALE—160 telephones, 100 miles of toll lines; excellent opportunity for extending business; will sell for \$12,000; pays 15 per cent. net on this amount. Address TELEPHONE CO., care of AMERICAN TELEPHONE JOURNAL.

WANTED

POSITION with Electrical or Telephone Manufacturing Company, by an expert battery-maker Twenty-two years old; good references furnished. THOS A. LOUGHRAN, JR., 28 Romaine Avenue, Jersey City, N. J.

WANTED.—Position as wire chief or manager of an exchange of 1,500 or 2,000 subscribers in a clean Western town or city by a married man of temperate habits, with twelve years experience with the Bell Co., but now taking care of an exchange district with 1,500 subscribers for an Independent Co. Can give good references. Address L. M., AMERICAN TELEPHONE JOURNAL.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISSELL CO., Toledo, Ohio.

A FEW more men wanted to take advantage of our gilt-edged offer: 5,000 Toll Tickets printed, \$1.75. Independent Telephone Printers: THE SUN-PRESS, Stockbridge, Mich.

The American Telephone Journal

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NEW YORK STATE MEETING AT ROCHESTER

IN response to a call sent out July 15th, the Independent Telephone Companies operating in New York State, met at Rochester on July 25th, to organize a State Association. The call was sent out in the name of the following companies, and was signed by Mr. C. E. Stinson, general manager of the Rochester Telephone Company:

Rochester Telephone Company, Rochester; Home Telephone Company, Albany; Home Telephone Company, Niagara Falls; Home Telephone Company, Tonawanda; Home Telephone Company, Lockport; Home Telephone Company, Medina; Home Telephone Company, Batavia; Home Telephone Company, Warsaw; Home Telephone Company, Troy; Home Telephone Company, Schenectady; Home Telephone Company, Elmira; Home Telephone Company, Binghamton; Kingston Standard Telephone Company, Kingston; Home Telephone Company, Newburgh; Home Telephone Company, Catskill; Utica Home Telephone Company, Utica; Home Telephone Company, Rome.

It was stated in the call that the objects sought in effecting a State organization were:

The exchange of views regarding the methods and forms of operating.

The standardizing and uniformity of equipment and construction.

The adjustment of any possible differences regarding territorial rights, etc.

A united effort to assist in speedily connecting all exchanges of the State with toll lines.

To give information and advice to individuals or companies contemplating the building of new exchanges.

To generally keep in touch with the new and rapid progress that is being made in Independent telephony.

The giving of moral and financial support in cases of litigation that might affect the interests of all members of the Association, etc.

Over one hundred and fifty companies sent representatives. The meeting was called to order in the County Court House by Mr. William B. Wright, of Buffalo, representing the Haines Telephone Company. He nominated Mr. Martin Carey, general counsel of the Frontier Telephone Company, of Buffalo as temporary chairman. A difference of opinion as to the advisability of this nomination resulted in the withdrawal of about half the delegates. These gentlemen organized in the parlors of the Powers House, where the headquarters of the meeting had been fixed. The two sets of delegates then proceeded to hold separate conventions. They took practically the same course, however, and differed only in the men whom they selected as officers and committee members. There was considerable discussion while the meetings were on, but after they were all over cool judgment prevailed and steps were taken by the leaders of both sides to bring the factions together. Such good progress was made that everything was practically settled except the date and place for the calling of a new meeting at which the differences will be adjusted and harmonized and a single vigorous State association formed.

The cause of the temporary split was in the conflicting interests of the two toll line companies that operate in the State. Each of these companies has numerous contracts with local companies, and there is some conflict as to territory. It was to settle this very question among others that the Rochester meeting was called, and at the forthcoming meeting an amicable and just arrangement will be reached.

COURT HOUSE MEETING.

The meeting over which Mr. Carey presided elected the following permanent officers: President, Martin Carey, Buffalo; vice-

president, C. E. Stinson, Rochester; secretary, Charles H. Blood, Ithaca, and treasurer, F. E. Lyford.

Executive Committee—President Martin Carey and Secretary Charles H. Blood, ex-officio; C. E. Stinson, George N. Orkett, Hornellsville; T. S. Lane, Jamestown, and Burt G. Hubbell, Buffalo.

"The New York State Independent Telephone Association" was adopted as the name of the organization, and, acting under instructions from the meeting, the officers and Executive Committee filed articles of incorporation with the County Clerk at Rochester. In these articles the objects of the association were set forth to be, among other things:

To promote the interests and welfare of the Independent telephone business; to collect and diffuse accurate and reliable information in regard to Independent telephone companies; to secure freedom in said business from unjust and unlawful exactions; to settle differences between its members and to promote a more large and friendly intercourse between the men engaged in the Independent telephone business.

The directors were named as follows: Martin Carey, Burt G. Hubbell, Walter P. Cooke, M. F. Dirnberger, and Francis M. R. Taylor, all of Buffalo.

The companies represented in the meeting that elected Mr. Carey as president were:

Dundee, Lakemount & Starkey Telephone system; Keith & Sons Independent Telephone system, Cattaraugus; Home Telephone Company, Jamestown; Genesee Company; Himrod Company; Watkins Telephone Company; Keuka Park, Branchport & Pulteney Company; West Ellery Telephone Company; Salamanca Telephone and Telegraph Company; Frontier Company, Buffalo; Crosby & Barrington Telephone Company; Valley Telephone Company, Waverly; Wyoming & Cattaraugus Telephone Company; Panama Co-operative Telephone Association; Warren Telephone and Telegraph Company; Union Telephone and Telegraph Company; Farm and Village Telephone Company, North Lansing; Madison and Onondaga Telephone and Telegraph Company; Kiantone Co-operative Telephone Association; Hornellsville Company; Haines Telephone Company, Buffalo; Consolidated Telephone Company, Buffalo; Inter-Ocean Company, Buffalo; Independent Company, East Randolph; Dansville Company; Canisteo Valley Telephone Company; Geneva Company; Oakhill Telephone Company; Buena Vista Telephone Company; Southern Tier Telephone Company; Howard & Buena Vista Telephone Company; Honey Run and Hartsville Hill Company; Oregon and Cameron Telephone Company; Dickey Telephone Company and Stewart Telephone Company; Allegany Mutual; Greenwood Telephone Company; Jasper and Canisteo Telephone Company; Albany Home Company; Penn Yan Company; Ithaca Telephone Company; Prattsburg Company; Bath Telephone Company; Corning Company; Almond Mutual Company; Portland Telephone Company; Madison and Onondaga Telephone and Telegraph Company; Atlantic Company, New York City; Canisteo Telephone Company; Frewsburg Co-operative Company.

POWERS HOUSE MEETING.

The meeting at the Powers House was called to order by Mr. George R. Fuller, of the Rochester Telephone Company, and the following permanent officers were elected:

President, George R. Fuller, of Rochester; Howard Hendrickson, Albany, for first vice-president; Boyd McDowell, Elmira, for second vice-president; Charles O. Harris, Rochester, for secretary and treasurer.

Executive Committee—S. B. Rawson, Lockport; J. S. G. Edwards, Gloversville; James S. Brailey, Jr., Utica; Edward Davis, Troy; F. M. Potter, Jr., Syracuse; C. D. Vernoy, Cortland; W. D. Barnard, Saratoga, and E. L. Barber, Rome.

The meeting also adopted the name of "The New York Independent Telephone Association," and the officers filed articles of incorporation with the County Clerk, which set forth the objects of the association as follows:

First—The protection of all Independent telephone interests of common concern to the members of the association within the State of New York. 2. The standardizing as far as possible of the equipment and construction of a telephone system in order that an early and efficient communication by

telephone may be had to all points within the State. 3. The establishment and maintenance of a bureau of information for the instruction, information and benefit of members of the association.

Second—The name of the proposed corporation shall be: "New York State Independent Telephone Association."

Third—The territory in which its operations are to be principally conducted shall be the State of New York.

Fourth—The town, village or city in which its principal office is to be located cannot now be determined, and it is not now practicable to fix such location.

Directors were elected as follows: Samuel B. Rawson, Elyria, O.; J. S. G. Edwards, Johnstown, N. Y.; George R. Fuller, Rochester; C. D. Vernoy, Cortland, N. Y.; Edward Davis, Philadelphia; W. D. Barnard, Philadelphia; F. M. Potter, Jr., Syracuse, N. Y.; E. L. Barber, Wauseon, O., and James S. Brailey, Jr., Toledo, O.

The following resolutions were unanimously adopted:

New York State Independent Telephone Association, in convention assembled at Rochester, N. Y., on July 25, 1902, hereby adopt the following address to the different Independent State telephone associations in the United States:

Whereas, Almost all the States have Independent telephone associations made up of the Independent telephone companies in their respective States; and

Whereas, It is the sense of this association that the various State associations should meet together in convention some time during the fall of 1902, and form a plan for co-operation or united action among the State associations; therefore, be it

Resolved, First: That this association hereby extend an invitation to the other State associations to elect delegates to meet with delegates from this and other associations at a convention or meeting called by the presidents of the State associations approving this action.

Second: That the various State associations at meetings which they may hold, shall elect delegates to such convention and empower said delegates to act for their respective associations.

Third: That this association shall elect four delegates at large and one additional delegate for each three thousand (3,000) telephones and one for every thousand miles of metallic circuit toll line, to represent the New York State Independent Telephone Association at said meeting or convention, and that the other State associations joining in said convention elect delegates on the same basis of representation.

Fourth: That this association is not taking this step as being against the interests of any other telephone association heretofore formed, but for the purpose of bringing the different State associations together and then to take such steps as may be deemed best for the interest of the associations represented by the delegates at such meeting.

W. D. Barnard, Binghamton; Jas. S. Brailey, Utica; F. M. Brush, Schenectady; J. R. Smith, Tonawanda, and C. E. Stinson, Rochester, as a special committee submitted a draft of a constitution and by-laws, which, after considerable discussion and amendment, was unanimously adopted:

CONSTITUTION OF NEW YORK STATE INDEPENDENT TELEPHONE ASSOCIATION.

ARTICLE I.—NAME.

The name of this association shall be "New York State Independent Telephone Association."

ARTICLE II.—OBJECTS.

The objects of this association are as follows:

Section 1. The protection of all Independent telephone interests of common concern to the members of the association.

Section 2. The standardizing, as far as possible, of the equipment and construction of telephone systems, in order that an early and efficient communication by telephone may be had to all points within the State.

Section 3. The establishment and maintenance of a bureau of information for the instruction, information and benefit of the members of the association.

ARTICLE III.—MEMBERSHIP.

Section 1. Any person, partnership or corporation owning, constructing or operating within the State of New York an Independent exchange having twenty-five subscribers or more, or a toll line of twenty-five miles of toll circuit or more, may become a member of this association by making application in writing (on blanks to be furnished by the association) to the Executive Committee, and upon being approved by that committee shall become members thereof and thereupon shall pay to the treasurer an initiation fee of five dollars (\$5), and thereafter shall pay the annual dues prescribed by this constitution.

Section 2. The annual membership dues shall be as follows: For the first one hundred (100) main line telephones or less, \$2; for each additional one hundred (100) main line telephones or fractional part thereof, \$1. For the first twenty-five (25) miles of toll line or fractional part thereof over which paid messages are transmitted, \$2; for each additional twenty-five (25) miles of toll line or fractional part thereof, \$1, and the further and additional payment from time to time of such assessments as the Executive Committee may levy to meet and defray extraordinary expenses, not to exceed in any one year a total of 5 cents for each main line telephone in use and 5 cents for each mile of toll line in use over which paid messages are

transmitted. The first dues shall be payable on or before September 1, 1902, and thereafter all dues shall be due and payable on April 1st of each year. Special assessments shall be due and payable ten days after being levied. Exchanges and toll lines under construction, the number of contracts and miles of erected poles shall be the basis of computation.

Section 3. Each member of the association shall, when requested by the secretary, give such information as may be required by the association for the purposes of determining the amount of assessment, and all other information that will be of advantage to its members; and during the month of January each member shall make a report, signed by the president and secretary of the company, under the seal of the company, upon blanks furnished by the secretary of the association, stating the number of telephones in actual operation and the number of miles of toll line in actual operation January 1st. Unincorporated members shall make such report under the head of its executive officer or partner.

Section 4. If any member shall fail to pay his annual dues during a period of three (3) months following the annual meeting, and after notice from the secretary, he shall still fail to pay the same, for a further period of thirty (30) days thereafter, such member shall be stricken from the membership list of the association.

ARTICLE IV.—MEETINGS.

Section 1. The association shall meet annually on the first Wednesday after the first Monday in May of each year, at such time and place as may be determined by the Executive Committee. Notice thereof shall be given to each member by mailing a copy of the call at least thirty (30) days prior to the date of such meeting.

Section 2. The president shall call a special meeting of the association upon request of the Executive Committee or upon request in writing of a majority of the members of the association in good standing. Ten days' notice of such special meeting shall be given in the same manner as provided for annual meetings.

Section 3. Fifteen properly authorized delegates present at any meeting shall constitute a quorum for the transaction of business of this association.

ARTICLE V.—OFFICERS, THEIR POWERS AND DUTIES.

Section 1. The officers of this association shall be: A president, first and second vice-presidents, secretary and treasurer and an executive committee to consist of nine members, one of whom shall be the president, and two inspectors of election. The office of secretary and treasurer may be held by the same person.

Section 2. The officers herein provided for shall be elected by ballot at the first meeting of the organization of this association and annually thereafter by ballot at the annual meeting of the association, and shall hold their respective offices until their successors are elected and qualified.

Section 3. The president shall preside at all meetings of the association and generally do and perform all the acts and duties usually done and performed by presidents of similar organizations. He shall appoint all committees other than executive committee, and shall countersign all checks drawn by the treasurer.

Section 4. The vice-presidents shall in their order perform the duties of the president in his absence or his inability to act.

Section 5. The secretary shall keep the minutes of the association and shall collect all moneys and receipt for same and turn the same over to the treasurer. He shall keep an accurate account of all receipts and disbursements of money and shall make a report at the annual meeting of the association and to the executive committee whenever called upon so to do; and he shall, under the direction of the executive committee, conduct a bureau of information for the benefit of the members of this association, collecting data and information relating to the welfare and promotion of this Independent Telephone Association. The secretary shall send out all notices of annual and special meetings and the meetings of the executive committee. He shall attend all meetings of the executive committee and keep proper records of the same, but shall not vote or take any part in their proceedings. He shall receive such compensation as may be fixed and determined by the executive committee.

Section 6. The treasurer shall have the care and custody of the funds of this association, and shall deposit the same in such bank or banks as may be designated by the executive committee.

All drafts shall be drawn by the treasurer and countersigned by the president.

The secretary and treasurer each shall give a bond, the penal sum to be fixed by the executive committee.

The inspectors of election shall perform the duties properly pertaining to their office.

ARTICLE VI.—EXECUTIVE COMMITTEE QUORUM.

Section 1. The majority of the members of the executive committee shall constitute a quorum for the transaction of business. Ten days' notice of meetings shall be given by mail at the last known address of each member of the committee.

Section 2. The executive committee shall have such powers, duties and authority as may be committed to or vested in it at any meeting of the association, and between the meetings of the association shall have full power and authority to transact any and all the business of the association.

ARTICLE VII.—VOTES.

Section 1. Upon the consideration of any business had at any annual or special meeting of the association, the delegates present at such meeting shall be entitled to one vote for each one hundred (100) telephones or fractional part thereof and in actual operation, and each twenty-five (25) miles

of toll circuit or fractional part thereof—the right to vote (excepting at the organization meeting) to be determined by the last report on file in the secretary's office of the number of telephones and the miles of toll circuit reported and accepted; providing, however, that no member shall be entitled to vote when any dues or assessments shall remain unpaid. Exchanges and toll lines under construction, the number of contracts and miles of erected poles shall be the basis of computation.

Each member of this association shall be represented by one delegate.

In case of an incorporated company, such delegate shall be a stockholder of the member, and in cases of unincorporated companies shall be some person financially interested in the affairs of such member.

Each delegate shall present proper credentials upon blanks furnished by the association.

ARTICLE VIII.

Section 1. The association may elect from its members one or more delegates to any national association of Independent telephone systems.

In the event of a failure to elect delegates the executive committee may appoint such delegates.

ARTICLE IX.—AMENDMENTS.

This constitution may be amended by a vote of three-fourths of the members present at any annual meeting of the association and at any special meeting duly called for that purpose, the object having been stated in the call.

The secretary reported that the companies represented at the Powers House meeting and their delegates were as follows:

Albany Home Telephone Company, Albany; Homer H. Hendrickson. Equitable Telephone Exchange, Arcade; O. T. Wilson. Batavia Home Telephone Company, Batavia; S. B. Rawson. Binghamton Telephone Company, Binghamton; W. D. Barnard. Black River Telephone Company, Boonesville; J. J. Domser. Black River Telephone Company, Constableville, Castorlands, Copenhagen, Lyons Falls, Lowville; T. B. Brasselin. Canandaigua Telephone Company, Canandaigua; C. E. Stinson. People's Telephone Company, Naples, Holcomb, Fishers, Vincent, Victor; H. W. Blake. Wayne County Telegraph and Telephone Company, Clyde; C. A. Lux. Home Telephone Company, Cohoes, Waterford; C. H. Williams. Cortland Home Telephone Company, Cortland, Homer, McGraw; C. D. Vernoy. Tioughnioga Telephone Company, Cortland; H. L. Smith. Syracuse Telephone

Company, Chittenango; Columbia Long Distance Telephone Company, East Syracuse; F. M. Potter, Jr. Rensselaer Telephone Company, Troy, Lansingburg; New Union Telephone Company, Glens Falls, Sandy Hill, Ft. Edward; Saratoga Telephone Company, Saratoga, Ballston; Edward Davis. Ontario Telephone Company, Oswego; R. A. Downey. Utica Home Telephone Company, Utica; E. H. Ferris. Home Telephone Company, Rome; Daniel M. Hall. Friendship Home Telephone Company, Friendship; H. A. Corbin. New Berlin Telephone Company, New Berlin; E. A. Smith. Union Telephone Company, Sidney; A. N. Siver. Independent Exchange, Manchester; Mr. Osgood. Skaneateles Telephone Company; H. L. Smith. Herkimer Home Telephone Company; J. S. Brailey. Ilion Telephone Company; E. L. Barber. Warsaw Home Telephone Company, Warsaw; J. H. Griswold. Rochester Telephone Company; George R. Fuller. Dunkirk Home Telephone Company; Elmira Telephone Company; B. McDonald. County Telephone Company, Horseheads, Frankford; James Fagan. Fredonia Telephone Company; S. B. Ransom. Baldwinsville Telephone Company; Fulton Telephone Company; People's Telephone Company, Watertown; Oswego Falls Telephone Company; J. K. Whitlake. Glen Telephone Company, Johnstown, Gloversville, Glen, Fultonville; J. S. G. Edwards. Great Northwestern Telephone Company, Carthage, Grosvenor; G. E. Milligan. Standard Home Telephone Company, Kingston; J. E. Klock. Interstate Telephone Company, Little Falls; Eugene Walrath. Home Telephone Company, Lockport; W. T. Ransom. Home Telephone Company, Medina; S. B. Ransom. Mendon Center Telephone Company, Mendon Center; E. H. White. Newark Telephone Company; W. H. Kelley. Home Telephone Company, Niagara Falls; W. R. Campbell. Home Telephone Company, Tonawanda; A. R. Smith. Home Telephone Company, Poughkeepsie; F. H. Griswold. Home Telephone Company, Schenectady; F. M. Bush. Seneca Falls Telephone Company, Seneca Falls; W. F. Flette. Perry Telephone Company, Perry; C. M. Smith. Southern New York Toll Line Company, Albany; J. H. Griswold.

The meeting adjourned at 3 o'clock in the afternoon, and on motion of Mr. J. S. Brailey, Jr., the convention proceeded in a body to the exchange of the Rochester Telephone Company for an inspection of the plant. General Manager Stinson showed the delegates the fine system of his company. The company is installing a new and much larger switchboard, and the delegates were much interested in this.

HOW SHALL WE HANDLE THE FARMER SUBSCRIBER?

By H. E. RALSTON

THE most important subject that the telephone manager has to deal with to-day is "the farmer subscriber." Not that the farmer is such an unruly, unmanageable or ferocious proposition as he sometimes appears to be, for he really is a very docile, peaceable person, once he becomes "bridle-wise," but he is like the proverbial "Thompson colt," and does a great many imprudent things before he becomes acquainted with this new appliance, which every well-regulated farm in this broad land of ours finds now to be an absolute necessity.

It is not the farmer that we mean to deal with so much as the managers or boards of directors of the various telephone companies that have attempted to handle him. And I want to say here, that a great many managers are being managed by the farmer. There are a great many men to-day that are holding the responsible position of manager of a telephone company, that should resign, or should be asked to resign, or, if the manager is sole proprietor of the company, as often happens, he should sell out before he everlastingly ruins the investment that opportunity and the support of his connection with others in the business, has made thus far successful.

As we examine closely the subject of the farmer subscriber we find that each company has a different proposition for him, and it does not require an expert to realize that there are many differences, indeed, practically no uniformity at all. Is it any wonder, then, that the farmer is bewildered and hesitates? Is it any wonder that he plots against the telephone company with which he seeks to do business? Is it any wonder that they, the farmers, keep telephone companies in a constant state of turmoil? Can any other business that is as mutual as the Independent telephone business is, long survive this kind of management and these conditions?

Let us see. One company to the west of me, is renting telephones to the farmer at \$2.00 per month, requiring \$50.00 to be paid in advance. One south of me is allowing the farmer to build his own line and connects him with the exchange for a charge of twenty-five cents per month. If he wants the privilege of service with an adjoining town the farmer subscriber pays another twenty-five cents per month, for a third town he pays another twenty-five cents per month, and for \$1.00 a month he may talk to the whole county.

A company to the east of me is taking farmer lines (built by the farmers) into their board and charging them ten cents per month for service. One to the north of me charges \$1.50 per month per drop in their switch board, and the farmers put as many stations on the line as they choose. And they choose to put on the whole countryside.

These are the conditions in a small section of this country. What is the result? The service is as varied as the terms, and the trials of the telephone managers are many. The man who gets \$2.00 per month is not having the worst of it either. The man who is getting practically nothing is threatened with a strike and with the establishment of an opposition exchange in the town by the organized farmers. In one place they are already building an opposition exchange. While the manager who builds the line and rents the telephones for \$2.00 a month, \$50.00 paid in advance, has comparatively no trouble. Why? The farmer is a business man. He has his telephone service; he has paid for it and has no "school-house" meeting to attend, no thought of financing a new telephone enterprise, and no troubles about connections. He has no expert work to do. He simply tells his trouble to the telephone man, who attends to it. He is satisfied and attends to his farming and makes money by it. But where the farmers build their own lines they hold meetings regularly at the school-houses, they "whereas" and "resolve" the telephone manager out of business and make life more of a burden to him than in common fairness it should be. He has his exchange subscribers at him about the "miserable" service he is giving in his exchange, when, if he would go out of town and cut every wire of the farmers' lines his service would soon be first-class in almost every case.

A farmer has an absolute right to go into the telephone business, and a telephone man has an absolute right to go into farming, but if a telephone man should run a farm as a farmer runs the telephone, he would not be a whit more successful than the farmer is in the telephone business.

What of us men who are spending money (lots of it) to improve our service and to extend our toll line connections? We strike this mismanaged company, find them unable to make the improvements in their territory that would be necessary to extend the toll line service, because they are "broke." And

why? They have been handling business without revenue or profit. Yet we must recognize this kind of a manager as an "Independent" and respect his territory. I call to mind one man who has spent six years in the service of his company (for he is his company) and besides has put into his business all he possesses; instead of being worth \$15,000 as he should now be, he is so badly off that I would not take his plant and agree to continue to run it, as he is now doing, were it tendered to me free of cost. Yet there are numbers of farmers in this same county that have acquired \$15,000 in the same six years, starting from a capital of less than \$1,000.

Why would I not take his plant? Because he has a "liability" instead of an "asset." His territory would be worth \$10,000 if there were not a wire or a pole in it. To change conditions now is beyond his power. He let the farmers work him into it and they now want to work him out of it. What would they do if he were to go out? That is what he should have done before he went in. Once the telephone man was out, the farmers would find that to operate a telephone plant costs money, and that to give a good service means the expenditure of lots of money. The farmer is now getting service for practically nothing, because he is getting the benefit of other men's money. I don't blame him. I blame the management that is, with our help, giving him this free service. He has access to our lines through the courtesy that we extend to fellow telephone men, by connecting with them, in consideration of a like courtesy that should be extended to us; but in this case it is not, for he has not been able to keep up the service or to build and equip the necessary lines. So we are really accessories to the mismanagement of the business.

What should be done? I shall not here write a prescription that can be guaranteed to cure all the evils of this one trouble, but I will say, first, telephone managers should be capable business men, that have some knowledge of the telephone on its scientific side and that are willing to study and learn more of it. (Too many men are managing a telephone business "On the side".) The telephone man need not be an electrician necessarily, for all electricians are not managers by a long jump; in fact the best electricians are failures as managers. But he should be a capable man with good common sense, and he should devote his time exclusively to the telephone business, *and be paid for his time.*

How many stockholders would invest their money in a bank with \$20,000 capital and allow the janitor to conduct the business with the aid of a board of directors that had other business to attend to? Or in a mercantile business and turn it over to a corps of clerks, or in fact, in any business and not place a competent man at the head of it that they thought had the ability to manage? A great many telephone companies employ an "electrician" for \$35.00 to \$50.00 per month and put him in as manager. Some enthusiastic member of the board of directors will take a hand in the management "when he has time," and so they go, giving service such as it is, and dealing with the farmers and with the public generally, more like school boys than like men.

Now, *I am not looking for a job*, but put in the office as manager the kind of man you would have manage a bank, pay him for his time, and use his time. Do not manage "on the side," or do anything else on the side. Teach him first that if it is worth \$1.00 to \$1.50 per month to give service in towns of 500 to 5,000 inhabitants, it is worth just as much, *yes more*, to furnish service to farms, where miles of line are to be kept up and stations are expensive to keep in repair. That even though some manufacturer will advertise that they have a telephone that will ring and talk with 40 stations on one wire, it is not practical or possible to render efficient service with more than ten, and only five is a safer limit.

Then stand back of this manager when he goes out and says he will not connect with a line that has more than ten stations on a party-line, or less if you choose, and don't be bluffed by a farmers' meeting in your town, when they turn out and say they are going to build their own exchange, or go to the Bell if you don't run it their way. For my part, I want the Bell to have that kind of customer. They don't want them; they may intimate that they do and try to make you think that they do, but they really want you to have them.

It is the business world that uses the telephone and pays for it. And when business men pay for service and get it, then they come again. Do not get together as directors and "resolve" and stiffen up your backbones and instruct your manager to do the right thing, and then allow the first committee of

farmers that calls on you to make you weaken. Ascertain what is right and just and equitable, lay down your principles and leave the manager to follow them as a good, cool, level-headed business man will, come what may. And then organize the toll-line men of your territory together and join with them in saying you will support each other in doing the right thing and will not connect with or support any company that does not conform to business principles. There are telephone companies that are "farmers" in the business; where you find them leave them to themselves, where they belong, and support and encourage the honorable profession of giving efficient telephone service and charging a price for it that will enable the company to keep up with the demands of its customers and with the progress of telephony. Call some of the bluffs. Allow some man or set of men that have learned more of the telephone business in six months than you have learned in six years, to lose some money in trying to run a telephone exchange for nothing. Stick to the text "Good Service at Reasonable Prices and Free Service and Passes to None."

Just a few words as to the way the company I represent is managed. We build the farmer lines and we own them. We don't parallel our grounded line with another grounded line, and we are making most of them metallic. We put *no more than ten stations* on a line. We keep stations and lines in repair and connect the farmer with his home town. We charge him \$1.50 per month. He pays \$75.00, or fifty months' service when the telephone goes in, or in advance. He pays toll charges when he talks out of the exchange the same as any other subscriber. *We do not handle farm lines that we do not own.* We have some "Mutuals" in our territory, but they are not the worst things to have, for we have men that contrast their service with ours, and we are giving satisfactory service while the Mutuals are not. We do not connect with or recognize a telephone company that will offer to connect with a "Mutual" line that enters our territory. We have none of their troubles, and we have lost nothing, for we have never had anything, they have now. They cannot go into the business and defeat us, for they would then be really in the telephone business and that means money and money must have an income.

When they realize that they are wrong the individuals will come to us (they will come because they must) and will pay us for service. We can give them service when they pay for it. Our investment is good because it is not unmanageable. The farmers' service is good because we can afford to keep it so. Our board of directors have the backbone to support the manager and the manager is responsible for the results. When he says we will or will not do a thing and appeal is made to the directors or to the president they simply refer all questions to the manager. Would that every telephone company had a backbone and the nerve to employ and pay a manager, who should be held responsible for the investment. Let me say again, telephone men should organize locally, as well as by State and national associations. Organize to support each other in an effort to give, maintain and extend good service and not to support in any way others that are degrading the business by giving free service, or nearly so; and poor service at the best. Ascertain what is just, equitable and profitable, make uniform rates for the farmers, stand by each other and protect your own investment.

COLUMBUS CITIZENS' TELEPHONE CO.

One of the best examples of Independent telephone development in the whole United States is the plant of the Columbus Citizens' Telephone Company, in the capital city of Ohio. The work of securing the franchise was commenced in the early spring of 1899, and the franchise was granted June 12, 1899, for twenty-five years. The company was immediately organized with a capital stock of \$500,000 which has since been increased to \$750,000, with \$750,000 of bonds authorized. Bonds have been issued to the amount of \$650,000, with 5 per cent. interest.

The plant was practically complete for 4,160 lines within one year. Owing to an unexpectedly large increase in the number of subscribers, it was found necessary to immediately make preparations for an increase to 5,200 line capacity. The increase was completed December, 1900, and before the last quarter of the year 1901 the above capacity was practically full. On December 31, 1901, there were 413 waiting contracts, and to-day there are upwards of 800 subscribers who are waiting for the service.—Edwin R. Sharp, president Ohio Bankers' Association, in *Finance* (Cleveland).

SELECTIVE TELEPHONES

By C. E. Nicholas

THERE are a great many kinds of selective telephone systems on the market to-day and all that are in use require a ground or more than two wires. This is an objection as it takes a trouble man of some experience to maintain such circuits and apparatus. However, on a central energy system a third wire could not very well be done away with. But for farmers' lines, where the circuits are long, they ought to be full metallic and as simple as possible. We find in our exchange that when we ring a signal on the line we always get someone. One of our subscribers on a farm line said to me, "If you want to find out who are rubbernecks on the line, just you step to the telephone and ring your own signal, then listen, and you will hear them come on one by one."

We have some fifty stations in farmers' homes and some lines with as many as nine instruments on each. This is about the limit, as with more I do not see how they could be numbered in such a way that an operator could easily grasp the situation.

When I entered upon my duties in this office, I found the farm line stations lettered A, B, C, D, and E. I soon found out that any one calling for A1 often got 81, and for A6 got 86; also E6 got 86, and C10 got 310, 6C got 63, and so on. In order to overcome this, in the next directory, I numbered the lines and stations in this way: The A drop was at line jack numbered 481, the first station is called 4811, the next 4812

and on up to 4819; this is as high as you can go on this line, as 4820 would be line jack 482. According to this system the first three figures denote the line jack number and the last figure the station. I have also established a system of signals so that the operator has but nine different rings to learn, viz.: No. 1, 2 long No. 2, 2 short; No. 3, 1 long and 1 short; No. 4, 1 short and 1 long, No. 5, 1 long and 2 short; No. 6, 1 short and 2 long; No. 7, 2 long and 1 short; No. 8, 2 short and 1 long; No. 9, 1 long and 3 short. This class of signals is not satisfactory; this is the place where a selective device of a thoroughly reliable character would be a blessing. However, we do not care to depart from a full metallic system or to be compelled to buy new instruments in order to get the desired selective working.

Now if all the selective telephones on the market to-day were arranged so as to be able to call or select a station on a full metallic circuit, not ring but the one bell and lockout all other stations and so give a man practically a private line, it would be a nice thing. Such a selective system, to attain its full usefulness, ought to be so arranged that anyone on the line could get any other station and lock out all the rest. Those two could then have a private conversation, but the operator at central must have absolute control of the line at all times. Such a system as this no doubt would revolutionize the so-called party-line business.

TELEPHONES FOR DIVERS

AMONG the improvements introduced in recent years in the equipment of the ships of the United States Navy is the attachment of a telephone to every suit of diver's armor furnished to the Navy. Every ship in commission carries at least one such suit, and one or more suits are supplied to all the navy yards and stations. The British navy was the first officially to recognize the value of this important application of the telephone, and the United States, quick to adopt any improvement, soon followed suit by incorporating the provision for telephones in the regular specifications for diving apparatus. The device is now in constant use and has proved to be in every way so satisfactory that it is difficult to understand why, outside of the navy, it has not entirely superseded the cumbersome system of line signals which merely enable the diver to indicate when he desires to return to the surface.

The diving armor supplied to the United States Navy Department does not differ externally from that in ordinary use, the telephonic attachments being entirely within the helmet. Each helmet is provided with a cap of stout canvas with a leather chain-strap on one side of which is fastened the telephone receiver so that it is held securely against the ear and can by no possibility slip out of position. Inside the helmet in such a position that the diver can speak directly into it by slightly turning his head is the transmitter. The connecting wire cable, about half an inch in diameter and heavily insulated, enters the helmet near the top through a water tight valve, which permits it

to be immediately disconnected if it is at any time desirable to dispense with the use of the telephone.

The diver's assistant is equipped with a similar cap and receiver, and round his chest is strapped a small nickel-plated shield, on which is mounted the transmitter with a funnel-shaped mouthpiece pointing upward so that he can speak directly into it by slightly lowering his head. Round his waist he carries the battery of five cells enclosed in a neat hard rubber case. It is the work of but a few moments to make the necessary wire attachments and put the little line in working order. Thus equipped the attendant has both his hands free to handle the air pump or hose or to comply with any directions that the diver below may telephone up to him.

Although divers rarely have occasion to work at depths greater than thirty or forty feet, yet the operation of ascending to the surface is so slow that there is a great economy of time in providing the diver with means of instantly communicating information of his wants or of the condition of things which he may find below. This is especially important in the naval service. For example, if a ship's bottom has sustained any injury the captain can keep in direct and constant communication with the diver, receiving instantaneous reports from him while his investigation is in progress. In almost all classes of submarine work a trial of the telephone as now used in the navy will readily carry conviction of its superiority over the old fashioned signal line.

HE GOT TELEPHONE CONNECTION

W. A. TUTTLE, a prosperous poultry raiser, who lives eight miles north of Medina, N. Y., is the originator of the new Rural District Telephone Company, recently incorporated with a capital of \$25,000. For two years Mr. Tuttle has been endeavoring to induce the Bell Telephone Company to place a telephone in his house, which is about 500 feet away from the main line connecting with Lyndonville. Last spring the Bell company offered to fix Tuttle out with a telephone providing that he would guarantee \$60 worth of business during the first year, furnish a bonus of \$75 and would also erect the necessary poles at his own expense.

Mr. Tuttle hesitated at accepting the offer because of the expense attached and then he conceived the idea of erecting a private line to Lyndonville, which is in the same county. Mr. Tuttle discussed with several Lyndonville residents the advisability of organizing a company and connecting Lyndonville and Yates with a telephone system. In quick order over thirty farmers were found to be willing to accept telephones at the usual out of town rate of \$12 a year.

The Stromberg-Carlson Manufacturing Company agreed to furnish telephones for the system. Many poles were ordered and the construction of the system, which is now nearly completed, was immediately commenced. Soon afterward residents of several towns to the east, south and west petitioned that they also be included in the circuit and several hundred applications for telephones were sent.

Now that the system has been gotten well under way, the Bell Company, realizing that it is bound to be a success, is endeavoring to get control of the long distance connections.

According to the charter of the new company no person can hold stock in the company save the actual renter of telephones, and at any time the company by paying the par value of the stock can retire that stock. The reason for such conditions is to prevent outside companies from getting control of the company.

The Rural District Company is now busily engaged in erecting poles and stringing wires to connect the villages of Lyndonville, Yates and several other small towns, and will soon commence operation.

TELEPHONE DEVELOPMENT ON THE WEST COAST

By P. KERR HIGGINS, A. M. I. E. E.

WITH exchanges in operation, franchises granted or applied for at San Francisco, Sacramento, San José, Pomona, Monrovia, Pasadena, Los Angeles, Oakland, Seattle, etc., the invasion of the Pacific Coast territory by the Independents may be considered to be fairly under way. The latest addition, that of Los Angeles, may be said to be the controlling point of the Pacific Coast south of Tehachapi. This territory covers an area of over 45,000 square miles and embraces probably the most equable climate in the world. The population, at last census, was 304,211, or an increase of over 100,000 in ten years. The city of Los Angeles has to-day a population of nearly 120,000 and is increasing daily, or by way of contrast, twenty years ago it had only a little over 11,500. Twelve years ago there was not a paved street in Los Angeles and one and two horse cars were common; to-day it has over 25 miles of paved streets and 165 miles of sewer; the most modern electric street cars not only cover the city, but there are lines running out of the city in different directions for over twenty-five miles, thus enabling its inhabitants to go to the seashore or to the mountains and return in less than three hours. Three trans-continental railroad lines enter the city and a fourth is now being built, so that Los Angeles may be reached from New York in about 90 hours. New business buildings, aggregating over \$23,000,000, have been erected during the past twelve years. Within a short distance are numerous small towns, making it very desirable as a telephone center. The Pacific Coast Telephone and Telegraph Company (formerly the "Sunset Company") have, until January 28, 1902, enjoyed a monopoly, and their treatment of their patrons has been on a par with that of other sub-licensees in the East; as a result, when the "Home Telephone Company" entered the field it was received with open arms and contracts flowed in very rapidly. This was due to four causes:

- (1) Excessive rates (of Bell Co.).
- (2) Ten party lines (of Bell Co.).
- (3) Obsolete apparatus (of Bell Co.).
- (4) Lack of discipline in operating room.

It is hardly necessary to go into the details, for it is the old story. The new Home Company is being engineered by the Empire Construction Company, of Toledo, Ohio, with F. F. Graves as general manager and C. Zahm, as engineer. Associated with these are men of large experience in the Telephone field. The local company is composed of twenty-three local influential men, and at least three of the largest banks are identified with the enterprise. Temporary quarters were secured on East 2nd street and arrangements have been completed for a central office at 244 South Hill street, where a handsome three-story building is now being erected. This will be very attractive, having a front entirely of stone, with carved stone cornices and modillions. The entrance will be through a wide vestibule, tiled and supported by marble stairs. The building will be absolutely fire-proof and will combine every feature for the accommodation of the company and its employees. A roof garden will occupy the entire roof and will be surrounded by a wall four feet high from the cornices. This garden will be a breathing place for the employees. The basement will cover a ground space of 35x142 feet and in it will be located the storage batteries, power plant and its accessories. The first floor will be occupied by the executive departments; the second, by the engineering department, while the third floor will be occupied by the switchboard, etc. The building will cost about \$60,000. Nearly all the contracts have been let and the foundation work, done by the California Ornamental Brick Company, for \$3,800,

is now almost completed. The iron work will cost \$19,375, and the cement floor and sidewalks \$889. In addition to this, nearly one-eighth of the underground work has been completed. The conduit used is asphalt paper in six-foot lengths, is cheap and easily laid and is said to be very durable, especially in this climate. It is confidently expected that this exchange will open early in 1903 with at least 10,000 telephones. The company in charge have shown good foresight in insisting on *absolutely no party lines*, and their success, in great measure, is due to this as the people are tired of party lines. The switchboard is unique, in that it will be the largest single multiple board in the West. The contract has been let to the Kellogg Switchboard and Supply Company, of Chicago, together with a large order for sub-station equipment. The ultimate capacity is 18,000 lines, and consists of 17 ten-panel operator sections, three operators to each section. Each position will be equipped with 120 subscribers' lines, capable of being increased to 140 if found necessary. The lines will terminate in lamps instead of a visual. The multiple jacks will be on 3-inch centers, following the plan of the one being installed by the Frontier Telephone Company, of Buffalo. Such an arrangement as this would be difficult with the ordinary jack, but inasmuch as the jack of this system requires only one spring in the jack, and two plug contacts, the strips may be built as substantially and maintain the high insulation obtainable in a $\frac{3}{8}$ -inch 3-point jack. The balance of the office equipment will consist of a two-position chief operator, two-position wire chiefs, one-position monitor and a two-position information desk. The system used will be the very latest common battery relay system. It is expected, in the near future, to connect up all the small towns, and finally to give a complete long distance service covering the entire coast, connecting with other companies now in operation or being built. Work is now being actively pushed in San Francisco, and it is hoped that that city will be able to give a full and efficient service along modern lines at an early date. The designs for a new and handsome building have been sketched out, but have not yet been made public. At Monrovia, a small town near Pasadena, the local exchange has for several years resisted every effort of the powerful Bell Company to coax or drive it out, at one time they even went as far as sending a section of board, a large number of telephones, canvassers, etc., but utterly failed and had to take their equipment back to Los Angeles. The people were satisfied with their local plant and service and refused service from the Bell Company, even when offered at a low rate and finally free. It seems strange that the West Coast was left clear so long, but I presume the organizers and builders were too busy in the East, but now having once begun, the work of installation will advance rapidly.

NO CUSSING OVER THE TELEPHONE

Dr. Gettys, a St. Louis physician, wanted to telephone a friend the other day. He called central, and offered every inducement to be connected. It seemed that one of the lines was in trouble, for the Doctor was kept waiting almost an hour and still could not get connection. He had visitors in his home, at the time, which made matters much worse. At last the Doctor could stand it no longer. He just "cussed" the telephone. He says he didn't cuss the girl, but just the instrument and service. But the girl heard it, and she called one of the male employees. The latter took the Doctor's name and number, and had him arrested.

Police Judge Sidener fined the Doctor \$5 and costs. In giving his verdict the court decided three unique points of law.

First, Judge Sidener decided that profanity has no sufficient provocation. Profanity, he declared, is always aggressive, never protective, and is therefore never excusable by the plea of self-defense.

The working principles of the law, it was further declared, have not been materially changed or invalidated by modern inventions; that crimes or offenses committed at long distance, such as the hurling of oaths at a person in another jurisdiction by means of the telephone, are amenable to the laws in the jurisdiction in which the offense is consummated.

IN THE OPERATING FIELD

SUGGESTION FOR A BUSINESS BUILDER

Editor AMERICAN TELEPHONE JOURNAL:

Dear Sir.—Different localities bring up different problems to confront the Independent telephone companies. In this particular city (Dunkirk, N. Y.) the Bell is especially strong, and it has been hard work to get any recognition from the two daily papers. They will publish every trivial matter in regard to the Bell, but have a very strong inclination to ignore the home company. Usually the Bell puts in a paid article (there is no mark on the article to show that it is a paid notice) stating that some Independent company somewhere has gone into the receiver's hands. This may be a true statement of fact or not—no one seems to care to verify the article—but, seeing it in a newspaper, the general public takes it for granted that it is true. It is not the policy of home companies to advertise. They do not have anything to advertise unless they have long distance toll connections. Usually the public feeling in a city or town is with the home company, and many companies rely on this to get business. Of course it is always best to have a good feeling on the part of the newspapers toward a company. There is hardly a difficulty that cannot be surmounted. In our case I got out blanks (copies of which I enclose), and then picked out all of our business sub-

Publishers Daily Herald:

Please insert under my display advertisement in your paper the following:

Home Telephone No.....

and oblige,

Yours respectfully,

scribers that were also advertisers in the two daily papers. I went to each subscriber and got him to sign the blank. Then, taking a copy of each paper, I filled in the home telephone number under each adv. in red ink, took a copy of the paper to the publisher, showed him the signed requests to insert their telephone number in their advertisement, and the next issues of both publications contained the home telephone numbers of their advertisers. By this means the papers were obliged in a way to advertise the Home Telephone Company, and it was also a benefit to the subscribers, as it called attention to the fact that they had a home telephone, consequently they got an increased number of calls, making them think that it was a good thing to have a home phone in their place of business. Respectfully,

B. F. REUTHER,

Assistant Manager Dunkirk (N. Y.) Home Telephone Co.

PROGRESS IN KANSAS

The town of Larned, Kas., is making great progress in its telephone facilities. The Larned Independent Telephone Company has recently erected a fine new exchange and installed a new switchboard. Up to the first of May this year all the telephone service the town could boast of was an automatic switchboard with about fifty lines connected. Toll line connections with all the neighboring towns as far east as Newton are in excellent working order at the present time, and a western toll line is now in course of construction which will connect Larned with all the smaller towns west within a radius of fifty miles. A farmers' party line, on which eight selective ringing telephones are used, has also been constructed. Other toll lines are building toward this place, and in a short time a network of wires will connect the little Western towns to the lines of the large Eastern cities.

Dr. Alex. A. Sharp is president and H. T. Taylor secretary and treasurer of the Larned company.

IOWA COMPANIES BUILDING TOLL LINES

Iowa Independent telephone companies are building hundreds of miles of copper wire return circuit lines in the State this year.

Last spring, when copper was cheap, nearly all of the Inde-

pendent companies purchased large quantities of wire. Some of them bought enough to rebuild their entire toll line systems.

E. H. Martin, of the Martin Telephone Company, and interested in the Mutual, said: "I would not venture a guess at the amount of copper wire purchased, but it will run up into the car loads. The Hawkeye, Mount Ayr, Central, Marshall, Boone County, Martin, and in fact nearly all of the companies bought wire. Our company is building a new line from Fort Dodge via Webster City to Des Moines. It will have but three stations, these being in the cities named. This line will all be copper metallic return circuit. We are also replacing the old wire and grounded return circuit lines we will still have in operation with the metallic. Other lines are being built out of Webster City, Fort Dodge, Boone, Mason City, Perry, Mount Ayr, Chariton, Oskaloosa and a dozen central points in the State of the same material. Some of the companies, like the Hawkeye and the Central are replacing all their old wire with copper return circuits. This means a great improvement in the Independent service.

"Some of the Independent service in the past has been first class, but there has been more of it that has not, and as we have connected tip with each other on a business exchange schedule, the service has not always been satisfactory. This is because when exchanges were first built by the Independents they were not flush with money, and used cheap wire and cheap material so as to cover a sufficient territory with the means at hand to make the service attractive. With the copper wire service that will be installed this season the Independents are going to be in a position to give a service that will be every bit as good as that of the Bell concerns, who, backed with unlimited capital, built well in the first place. But the strong point will be that the mutuals cover so much more territory that, with this service, our lines will be more attractive than the Bell lines. We will reach every important point in Iowa with first-class lines, and we expect to increase our business at a great rate when the work is completed and the public comes to know what we are doing."—Register (Des Moines).

A BANKER ON THE OHIO SITUATION

The greater part of Ohio is covered by the Independent system; its wires are everywhere, and its stockholders are the people. One community connects with an adjoining community, and so on to the north, south, east and west, creating a bond of common interests, mutual good will and friendships, that makes the Independents a sort of brotherhood. In central Ohio the Independent system is now so fully established and in such common use that when a telephone is spoken of it is assumed that it is the Independent to which reference is made. Every village, hamlet and community in this section of the State is now fully provided, and one can get Independent telephone connection with nearly every farmhouse throughout central Ohio. Subscribers who at first thought the telephone a luxury have become so dependent upon it that rental would have to be increased several hundred per cent. before they could be persuaded to dispense with it. The Independent telephone movement has passed the experimental stage in this State; it is an assured success, and is in the hands of strong, successful and conservative business men, who make the situation in Ohio most promising, giving to all that friendly and commercial touch that makes the whole world akin.—S. B. Rankin, secretary Ohio Bankers' Association, in *Finance* (Cleveland).

TELEPHONES IN SPAIN

Telephony is not very well developed in Spain. The government claims a monopoly in telephones as in telegraphs, and for a time tried to run the telephone business, but gave it up about 1886 and framed regulations under which licenses or franchises would be issued to individuals or companies desiring to furnish telephone service in any particular town. The person or company offering to pay the government the largest percentage of the gross receipts gets the franchise, the government fixing the rates. Some telephone companies in Spain pay a royalty to the government of as much as forty per cent. of the gross revenue, but the majority get off for much less than that. As a consequence of these regulations there is very little telephone development in Spain.

Opinion and Comment

THE ROCHESTER MEETING

IT WAS, of course, not desirable that there should have been a split in the meeting called at Rochester for organizing a New York State Independent Telephone Association. But, after all, no great harm will result, and the affair has its bright side. The action of the attending delegates on both sides in standing up for what they considered to be their rights shows conclusively that the perfunctoriness that has too often in the past characterized Independent Conventions, State as well as National, is at an end, and that the men who attend these meetings as well as the companies affected are thoroughly awake to the advantages that lie in aggressive organization and co-operation. It is, after all, much better to have some ginger in such a meeting than to see the spectacle of a mere passive gathering, which is dormant and content under the domination of any man or set of men. If the same spirit can be infused into the next National Convention it will be of decided advantage to the movement. This, of course, does not mean that there ought to be a split in the National Association or that it would be wise to hold two separate conventions. It is simply that the Independent movement will make even greater strides than it has in the past if the operators will take their State and National Conventions seriously and hold the officers of their associations to a strict accountability, taking not merely a social interest, but putting their shoulders to the wheel, doing active personal work, and demanding of their servants that they do the same thing. That is the sort of stimulus that men in any position need. It is too much to expect that an association officer, whether he be State or National, will take that keen interest in his duties that is required for the mutual interests of the association members if these members are themselves lukewarm. The moment that it is known that the enrolled members of an association are alive and watchful, that they will not accept half-hearted service, the men entrusted with the management of affairs may be depended upon to perform the duties of the office to which they are elected, for then they know that unless they do this there will be a prompt reckoning and a new occupant of the chair they are holding down.

If there was any prospect that the trouble at Rochester was deep-seated or threatened permanent disturbance it would of course be deplorable. But of this there is no fear. The contending interests have already taken conservative counsel and are looking at matters from a common-sense standpoint. They are shrewd, wide-awake business men, and realize that nothing would please the Bell interests so much as a permanent disaffection in Independent ranks here in New York State. The differences that brought about the trouble are purely private, and the men interested admit that they will be easy of adjustment. It was a conflict of the Hubbell syndicate, of Buffalo, and the Rawson syndicate, of Lockport and Niagara Falls. These two syndicates are in the field for toll line business, and have antagonistic interests at certain points. A common-sense adjustment, granting certain territorial rights, will settle the whole matter. THE AMERICAN TELEPHONE JOURNAL is assured by both sides that such an adjustment will take place in the near future, and as soon as this is accomplished all differences will subside and a State Association be formed in which all the Independent companies in New York will take an active part. The rules and by-laws adopted at Rochester seem to form an admirable basis to work on, and will repay careful reading, not alone by the New York State operators, but by operators in general.

ZONE RATES FOR TOLL TARIFF

THE paper by Mr. H. C. Winter, on "Toll Rates and Toll Division," read before the convention of the Wisconsin Independent Telephone Association and printed in full in a recent issue of THE AMERICAN TELEPHONE JOURNAL, contains some suggestions regarding toll rates that are worthy of serious consideration. The question of toll rates is one of the most difficult problems before the Independent telephone industry, and a correct solution of it will be a powerful aid to the prosperity and solidity of the industry as a whole. By a correct solution, we mean the adoption of rates that shall be uniform, or based on a common unit, that shall be popular with the public and that shall give a remunerative return on the most efficient service that can be produced. To arrive at such a system of rates is by no means an easy matter, and will require both a spirit of coöperation and a scientific study of the question that so far have not been too manifest in Independent telephone circles.

The zone system of rates advocated by Mr. Winter offers promise of a uniform and satisfactory method of charging for toll service that has many advantages. It is simple and easily understood both by telephone operators and by the public; it is applicable to any locality and to any distance, once the zones and their corresponding charges have been agreed upon, and as applied to railroad fares it has already proven a popular and commercial success. It has the great merit that in this country it would be a complete novelty. Its simple and practical features would appeal so readily to the quick intelligence of the American people that the Independent telephone companies would probably get generous praise and wide public notice through its introduction.

But while the general method of charges by zones is sound and easy of adoption everywhere, as every place becomes the centre of a series of zones, the details require careful working out, and, above all, a thorough study of costs. On these points Mr. Winter seems to us to go astray. The line costs of toll service have a much wider bearing than Mr. Winter admits in what he calls "the construction expense of transmission." Well built toll lines not only mean substantial investments, on which interest has to be paid, but they are very perishable plant, subject to high charges for depreciation, often costing heavily for rebuilding after severe storms, costing much to maintain, and generally something for rights of way. Line costs for toll service are by no means to be dismissed so lightly as Mr. Winter seems to consider.

This error, which is fundamental, leads him into an unsound method of measuring his zones. By adding miles by arithmetical progression to each step of five miles Mr. Winter soon reaches zones where the charges would be altogether too low. And this error is cumulative, for, as the distance reaches the point where the line cost becomes the predominating element in the cost of the message, the charges under Mr. Winter's proposed system become less and less profitable by reason of the steady enlargement of each zone. For example, fifty cents for 81 miles, or five-eighths of a cent a mile, may pass, but, with the widening zones, 200 miles would get only 85 cents, or .425 cent a mile; 300 miles would get \$1.10, or .36 cent a mile; 500 miles would get \$1.45, or .29 cent a mile, and 1,000 miles, where the zone becomes 45 miles wide, would get only \$2.10, or barely over a fifth of a cent a mile. Such rates would clearly be unremunerative. A sound system must be capable of indefinite expansion. However, while the details of Mr. Winter's proposed scheme of rates are open to criticism, the fundamental idea of basing toll rates on the zone system is an excellent suggestion deserving of the aid and support of all toll line operators.

CONTEMPORARY CROSS-TALK

AT THIS point in our rambling discussion of the rate problem it might be well to pause and summarize what has been proved, or at least what has been stated and attempted to be proved in the previous half-dozen talks on this interesting and highly complicated subject. I think it has been fairly well proved (a) that the minute-mile is the true and correct unit of telephone service, (b) that the city subscriber uses a greater number of minute-miles in each message than the country subscriber, (c) that the city subscriber uses a greater number of messages daily than the country subscriber, and (d) that the minute-mile is more costly to produce in the city than it is in the small place. Now, granted that it is impracticable in the local service to put the service on a minute-mile basis, and to charge each user, as is done in dealing with toll service, according to the number of minute-miles he uses, it is none the less absolutely necessary to keep the minute-mile unit well in mind in determining city telephone rates. That the average local telephone message occupies the plant for not more than three minutes is a pretty safe assumption, and in any case, as I have previously pointed out, the telephone manager has a check on the time element by limiting the duration of a message to five minutes, which enables him to charge those who habitually use long messages accordingly. But on the distance he has practically no check. The average miles in the city telephone message will grow as the city grows in area and as the telephone system spreads and increases. Under flat rates the average traffic per subscriber will also grow very rapidly with the development of the city and of the telephone system, so that with flat rates there are three avenues along which the amount of service rendered each subscriber increases, while the revenue per subscriber stands still. These are: The time occupied by each call (for, with flat rates, there is no check on the duration of the call), the distance traversed by each call, and the number of calls a day. Could there be any surer method of riding for a fall than the flat rate?

* * *

However, we had better once and for all consider flat rates as put out of court for city telephone systems. Their day has undoubtedly gone by, and it is plain to any observer of telephone affairs that, if high enough to be profitable, flat rates repress the development of the telephone to a point immensely below the well demonstrated possibilities of that development, and, if fixed low enough to permit of a fair development, they soon become hopelessly unprofitable. Apparently, however, it will require nothing short of bitter experience to convince many telephone managers of the fundamental unsoundness of flat rates for telephone service on a large scale. Almost the only defence left for them nowadays is the archaic theory that it is better to operate a small system at a profit than a large system at a loss. That is an obvious proposition. It is certainly better, if the world will let you, to run a small business at a profit than to try to run a large business from which you must necessarily fail to make a profit. But in the case of the telephone service the world will not let you run a small system and pocket your snug profit. It has lately been shown what the telephone service can do in a large city, and the people have awakened, to a certain extent, to its possibilities. They now demand a large system, reaching everywhere and available to everybody. Your small system will be no good to the majority, and it will soon be no good to you, because someone will come along with a system run on lines that will permit indefinite development, and the small system will grow gradually and beautifully less. In short, the city telephone system of to-day and of the future must be capable of unlimited development, and the flat rate is not a developer. If it is high it scares away the public, and if it is low it soon scares that most timid object, capital, by failing to produce the dividends that capital requires wherewith to cloak its timidity. So enough of flat rates.

* * *

It has been said, and it scarcely needs repetition, for it is plain to every observer, that the average distance traveled by the city telephone message necessarily increases with the growth of the city and the expansion of the area covered by the telephone system. So that, knowing that our costs are based on the scientific minute-mile unit, we are confronted with an element of cost that will steadily increase as time goes on, while it does not seem practicable to adopt a system of rates which shall cause the

revenue to increase in proportion to that slow but sure increase in cost. By general consent and common practice we are tied to the method of charging by the message, let the distance traveled by the message be long or short. We know that the distance that the average message will travel will surely increase. It may not be a very rapid increase, but it will be sure, steady and inevitable, as sure as the widening of a mighty river as it flows from source to ocean. Now, how is this inevitable increase in cost going to be met by the telephone manager who knows that his costs are based on minute-miles and who can only base his charges on messages? He can take care of the minutes, as we have seen, but how is he, while professedly basing his charges on messages (which means the average number of miles) to take care of the miles, which he knows will steadily grow on him? How has the question been met so far, and how will it be met in the future, when the great growth of cities and great development of city telephone systems that are certain to occur will make it a very much more serious problem than it is at present?

* * *

In some of the largest cities in the world the distance element is recognized by the simple expedient of establishing zones and charging an additional rate for messages passing from one zone to another. Thus, in the new London rates the area covered by the London system is divided into two portions, inner and outer London. A message local either to the inner or to the outer area pays a certain rate, while a message passing from one area to the other pays a higher rate. This is a full and complete recognition of the important bearing that the distance element has on the cost of furnishing local telephone service. In Berlin much the same practice is observed. There are an inner and an outer Berlin, and the rates for service over the combined area are higher than the rates for service in one area alone. In other cities suburban points that are very little distant from the city centre, and that the growth of the cities will in time practically envelope, are subject to a toll. New York City, as it legally exists to-day, is conveniently divided into boroughs, and is physically divided by nature in such a way as to make varying rates between different parts of its enormous area not only necessary but entirely natural and acceptable. So that we see that in the largest cities in the world the telephone rates for local service are framed in recognition of the distances that telephone messages have to be carried within the city limits.

* * *

Even with this proof before us that in certain great cities the conditions are such that the area may conveniently be divided into zones or districts between which additional rates may be demanded and will be paid by the public without protest, the fact remains that many cities, probably the majority, are not so situated. The method of taking care of the greater distances by the establishment of two or more zones is certainly the simplest and most effective, but, as applied to this country and to the methods by which telephone traffic will eventually be operated, it encounters many difficulties. In the first place, the public, accustomed to a flat rate or to a flat charge per message, to flat rate car fares with continually increasing transfer facilities and continually lengthening lines of car travel, would quickly and noisily resent the establishment of arbitrary zones in a city area between which the charges for city telephone messages should vary. Even if such a method were accompanied by reductions in the rates for messages local to each zone, it is doubtful if the plan would be endorsed by the press and public, though its accordance with the real conditions of the business could be fully demonstrated. Apart from that, however, it is certain that all local telephone traffic will eventually be metered automatically, as gas, water and electricity supply are now metered. With the present cumbersome pencil and pad method of metering telephone messages it would be easy to employ the zone system, to endorse the record of a call that it was from Zone A to Zone B, for instance, or local to Zone A or to Zone B, and the accounting department would make the corresponding charges. But an automatic meter will simply record calls or messages, and can hardly be made to differentiate between zones. So the zone system, attractive as it is, popular as it might be made, and popular as it has proved to be applied to other services, is apparently ruled out of court.

The Listening Key.

FOREIGN CURRENTS

IN connection with the interesting reminiscences of Mr. J. G. Lorraine, M. I. E. E., the distinguished telephone engineer of England, as published last week in *THE AMERICAN TELEPHONE JOURNAL*, it is instructive to note the changes that have taken place since the time of which Mr. Lorraine writes.

* * *

The numerous telephone companies that were organized all over England were eventually consolidated into the National Telephone company, which until quite recently had an absolute monopoly of the telephone business in Great Britain. During late years opposition to the National has started up in various of the large cities in the form of municipal systems, and this is a growing movement, as, rightly or wrongly, the National company is somewhat unpopular, and the English public and English municipal authorities seem to think that telephone service can be had both better and cheaper than that furnished by the National Telephone Company. There are already several municipal systems in operation, and there is a continually growing list of towns and cities in which the establishment of a municipal telephone system is more or less a live question. The British Post Office has always dabbled in telephony since it established its legal right to a monopoly of the telephone some twenty-four years ago, but it has done no work on a large scale, except the trunk line system, until the recent establishment of its London exchanges, mention of which has been made in these columns.

* * *

The National Company, however, in spite of municipal and Government opposition, is still doing a growing business. At the annual staff dinner, held a month or so ago, the general manager of the company gave a very satisfactory account of the year's progress. During the past year the number of subscribers had increased by 20,000, the total now reaching 226,000. There were 1,025 exchanges at work, and the number of messages dealt with during the twelve months was 787,000,000, an increase of 75,000,000 over the traffic of the preceding year. Mr. Gaine seemed to think that the National company would win out in the competition with the Glasgow municipal telephone department, and believed that the more subscribers the Glasgow corporation got the more difficulties they would have to meet.

* * *

Regarding the progress of the Glasgow system, some interesting items of information occur in a report made by a deputation of the Special Committee on Telephones of the Manchester City Council. Manchester, with the neighboring corporations of Salford and Stockport, comprising a large and rich area of great commercial activity, with a population of considerably over half a million, is agitating the question of a municipal telephone exchange, and a deputation of the committee organized to deal with the matter recently visited Glasgow to inspect the municipal telephone system there and gain information as to its working. The report stated that the actual expenditure to May last on the Glasgow telephone system was about \$800,000, and this sum had provided accommodation for about 7,000 subscribers, say an average capital expenditure of \$114 per subscriber. Under the original estimate of \$600,000 it had been calculated that the complete outlay per subscriber would be under \$100, but prices of material rose during the time of construction, extra wires were laid underground to save expense hereafter, and the work of carrying the wires from the ducts up the many-storied office buildings also ran into money.

* * *

There were at the time of making the report 7,206 applications for service filed, and of these 5,302 had been dealt with. Further connections are being made at the rate of 480 per month, while new orders for service are being booked at the rate of 300 per month. About 40 per cent. of the subscribers also take the service of the National Telephone Company, whose tariff is \$50, or nearly double the rate of \$26 charged by the corporation. The balance sheet for the first eight months is stated to show an income (for the eight months only) of \$54,470, and expenses—in-

cluding \$20,310 for interest and sinking fund—of \$53,985, leaving a net profit of but \$485. The ratio of profit is expected to increase with every fresh subscriber up to 10,000, as much of the capital is not fully productive pending the connection of additional subscribers. The corporation's license from the Post Office expires in 1913, and the corporation is said to view the future with equanimity, whether the Post Office grants an extension of time or elects to buy the system up.

* * *

The area served by the Glasgow system includes eight independent boroughs and covers 143 square miles, the farthest point from the central exchange being 17 miles. In only one of these boroughs are the circuits being erected on the overhead system, otherwise all the main lines are in underground cables. In view of the information as to the satisfactory working of the Glasgow system, the report recommended that the Manchester-Salford-Stockport telephone scheme be proceeded with. From another note we learn that the Glasgow underground system, the completion of which by the British Insulated Wire Company formed the occasion for a joint celebration by the telephone men and the cable contractors, is considered to be the second largest underground telephone system in the world, the Post Office system in London taking first place. The work completed at Glasgow comprises 100 miles of 3-inch cast-iron pipes and about 150 miles of cable, equivalent approximately to 30,000 miles of single wire. Glasgow also claims to have installed the largest telephone cable ever made. This cable, being too large for the standard 3-inch ducts, is accommodated in a special 6-inch pipe. The size of the cable and the number of wires are not mentioned by the *Electrical Times*, from which we cull these notes.

* * *

The National Telephone Company is certainly playing in hard luck, as, in addition to the competition and obstruction it is meeting with in various towns—in one town, Hull, the dispute between the company and the municipality is so acute that the company threatens to remove its equipment entirely and leave Hull without telephone service—in addition to these troubles, it has recently suffered the misfortune of having one of its large London exchanges completely destroyed by fire. The exchange was in the heart of the business district, and served nearly 2,600 subscribers. The destruction of a telephone exchange is a positive calamity, and even the fact that it makes people realize how invaluable the telephone service has become to them is no compensation for the loss and worry. It is estimated that it will take eight or nine months to rebuild the exchange completely, as an entire new equipment must be manufactured. Meanwhile the company is putting temporary boards, which were started from the factory before the fire was out, in an adjoining building and working continuously to join up lines, so that it was expected that in ten days after the fire all the subscribers cut off would be restored to some sort of a service. Every telephone man's sympathy will go out to the National Telephone Company in a misfortune like this.

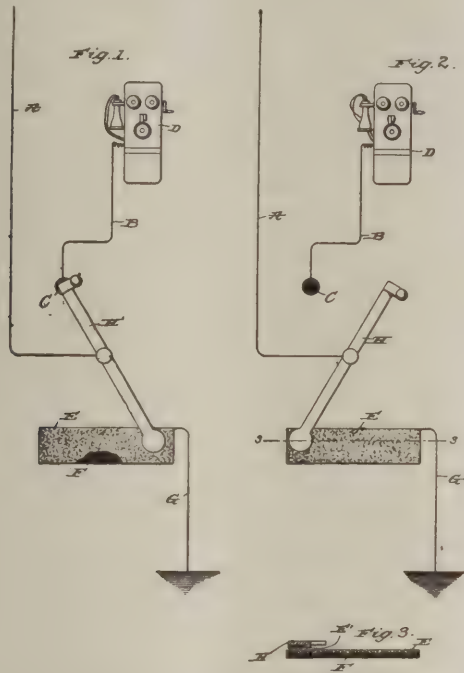
The Arrester.

THE BELL IN OTTAWA

It serves the purpose of the boomsters for the Bell Telephone Company to pooh-pooh the figures quoted in these columns yesterday from the *Hamilton Spectator*, at which the Neill and Rogers companies offer to supply a modern up-to-date service in that city. It is absurd, they say, to talk of giving a first-class service at \$10 and \$15 (Rogers' offer) or \$18 and \$30 (Neill's offer) for house and office 'phones, respectively, as if the capitalists promoting the rival systems did not understand their business when they propose to invest the capital necessary to install the plant. If the public has been misled by the assurance of Bell boomers in this matter it is not to be too severely blamed for its credulity. It has been accustomed to receiving the word of the men who are doing the talking, and did not know that the Bell company is itself in certain localities doing business at the very figures in question. From a table of statistics quoting the rates of the Bell and Independent telephone companies doing business at various points in the United States, it appears that the Bell company is to-day doing business at certain competing points at less than one-half of the rate formerly charged and below the rates quoted by Neill to Hamilton.—*Ottawa Citizen.*

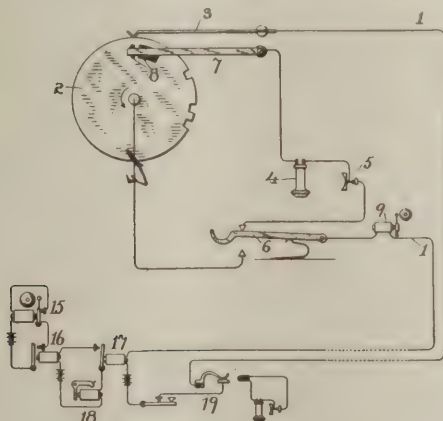
PATENTS.

William J. Bell, of Baraboo, Wis., patents (No. 703980, July 8, 1902) a combined switch and lightning arrester which has for its general object to provide a peculiar and advantageous combined switch and lightning arrester calculated at all times to effectually prevent heavy charges of atmospheric or other electricity from passing from the line wire of a telephone system to



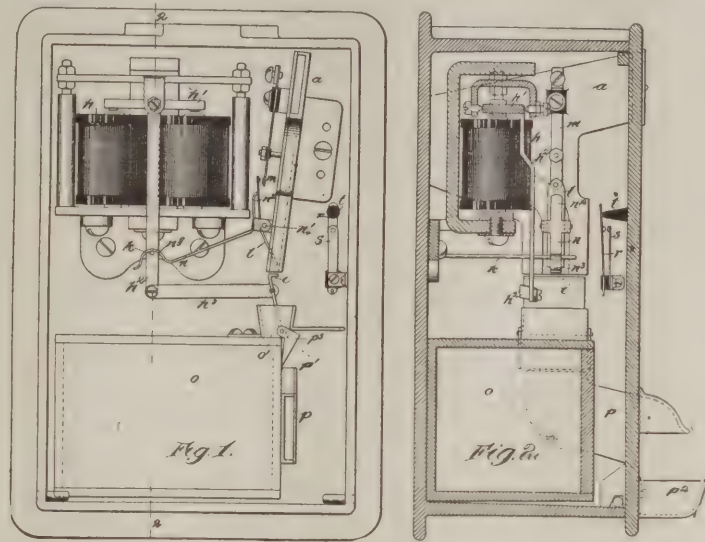
a telephone instrument. The diagrams illustrate the device very clearly. The switch H normally connects the line wire A with the instrument wire B. The lower arm of the switch carries a carbon plate E¹ (Fig. 3), which is in close proximity to the grounded carbon block E. In either position of the switch the plate E¹, on the end of the lever, is over the block E.

Charles Selden, of Baltimore, patents (No. 704127, July 8, 1902) a combined district telegraph and telephone signal for use in systems wherein telephone apparatus is employed upon a district telegraph circuit to permit the district telegraph subscriber to communicate orally with the district telegraph central office. The object of the invention is to produce a peculiar character of

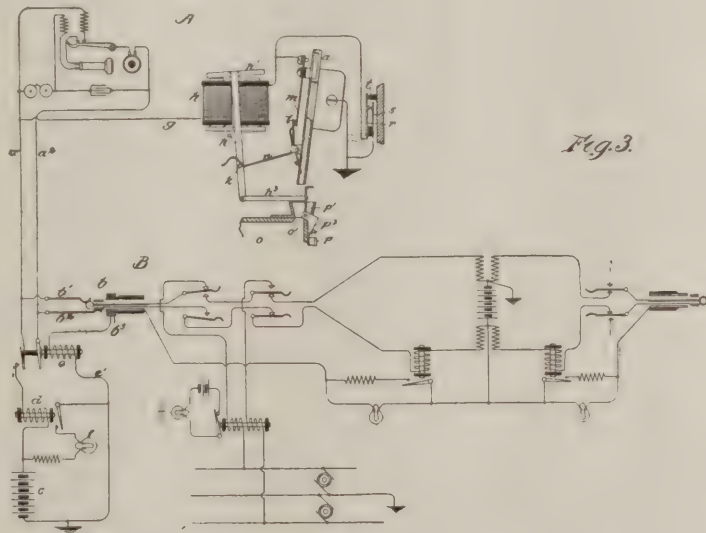


additional or distinctive signal so that the central office attendant may immediately be informed by an audible sign that telephone communication is desired. In the diagram 2 is the usual contact wheel for transmitting the usual messenger call signal by means of the brush 3 and the notches in the periphery of wheel 2. The special telephone signal is sent by means of the contact brush 7 and the slots or insulated bushings 8 in the face of the wheel. The special brush 7 is cut in circuit by the hook switch 6, and is consequently operative only when the receiver has been lifted from the hook. The special telephone signal is received at the central office by means of a vibrating bell.

Joseph J. O'Connell, of Chicago, patents (No. 704268, July 8, 1902) a coin collector for telephone toll lines which is an improvement on an existing type of box patented (No. 665874) January 15, 1901, by Albert M. Bullard. The contacts closing the line to signal the exchange are operated by the coin inserted; in the Bullard patent a shunt was provided round the magnet of the coin box to maintain the circuit after the coin was



dropped, whereas in the present patent the circuit is maintained mechanically after the coin has been released. In the drawings Fig. 3 is a diagram of the circuits of a line equipped with the coin box and connected to a central energy exchange. The polarized magnet *h*, controlling the coin releasing apparatus is in a branch to ground from the line wire *a*¹. The contact *m* mounted on the coin chute but insulated from it and the pivoted contact *l* are brought together when a coin is dropped in the slot and tilts *l*. This completes the circuit and signals the exchange. Referring to Fig. 1, the chute *a* is closed by the valve *i*, which is controlled by the link *h*² and lever *h*² by the armature of mag-



net *h*. The operator, by sending a positive or negative current along the line, can move valve *i* either to the left and drop the coin in the return chute *p*, or to the right, which allows the coin to drop into the cash box *o*. The central spring *k* passes through lever *h*² and over *k*, rides the cam end *n*² of lever *n*, pivoted concentrically with contact lever *l* and having its bent end *n*² bearing on the upper branch of *l*. The movement of *k* in either direction bears on one side or the other of the cam *n*² and causes *n*² to bear against *l* and maintain it in contact with *m* even after the coin has been allowed to drop by the diversion of *i*. The wedge *p*², linked to *i*, is to prevent a wire being passed up the recovery chute.



Legal

HARTFORD, KY.—The Cumberland Telephone and Telegraph Company has filed suit in the Ohio Circuit Court to enjoin the Rough River Telephone Company from interfering with its lines by erecting its poles at certain points in Hartford. The injunction will be argued before Judge Owen at Hawesville.

Financial

ANITA, IA.—The Rural Telephone Company, of Anita, has increased its capital stock from \$10,000 to \$25,000.

WEST SUMNER, ME.—The Oxford County Telephone and Telegraph Company recently held two stockholders' meetings, and voted to increase the capital stock to \$25,000, and also to make arrangements to make long distance connection on the best terms available. This company now has about 200 miles of wire, being the fourth line in the State.

MINNEAPOLIS, MINN.—The board of directors of the Twin City Telephone Company, of which E. H. Moulton is president, have declared a quarterly dividend at the rate of 7 per cent. per annum on the preferred stock of the company, payable August 1st. Transfer books were closed July 25th, and will reopen August 5th.

COOPERSTOWN, N. Y.—The town clerk has received from the State Board of Tax Commissioners the assessed valuations of the special franchises of telephone corporations in the town of Otsego for 1902 as follows: Cooperstown Telephone Company, \$1,000; Milford Telephone Company, \$550; Central New York Telephone and Telegraph Company, \$4,000.

YORKTOWN, N. Y.—The directors of the Yorktown Telephone Company, of Westchester County, have voted an increase of its capital stock from \$2,500 to \$4,000. The directors are James E. Rice, Theodore F. Tompkins, Edward B. Kear, F. Q. White, E. M. Frost and Albert Lee.

New Companies

CANTON, ILL.—The Canton Home Telephone Company has been incorporated with a capital stock of \$75,000; incorporators, F. G. Bills, G. F. Miner, O. S. Baileys.

CHICAGO, ILL.—The Stephenson County Telephone Company of Chicago, has been incorporated to operate telephone and telegraph systems; capital stock, \$150,000. Incorporators—Fred G. Bills, George F. Miner and O. S. Baileys.

SIBLEY, ILL.—A telephone company has been incorporated here with a capital of \$5,000, to operate farmers' lines.

BRIDGETON, IND.—The Independent Telephone Company held a meeting here recently, and will incorporate the line.

STOCKWELL, IND.—The Stockwell Co-operative Telephone Company has been incorporated by W. O. Laird, M. C. Cann, J. W. Skinner, J. S. Storms and E. N. Stout.

WELLSBURG, IA.—The farmers between Wellsburg and Cleves have organized to erect and put in operation a telephone line. D. De Neui is president, Joe De Neui, Sr., treasurer, and Dr. Heddens, secretary. W. Eoss, Joe De Neui, Jr., and Fred Fisher are the directors.

WHITTEMORE, IA.—The Whittemore Telephone Company has been incorporated with a capital stock of \$1,500.

WOODWARD, IA.—The People's Mutual Rural Telephone Company of Woodward, has been incorporated with a capital stock of \$3,500.

PARK RAPIDS, MINN.—The Citizens' Telephone Company has been organized with a capital stock of \$10,000 to build and operate an exchange here. Officers elected are as follows: President, Hugh Alexander; vice-president, S. S. McKinley; secretary, Frank Heisel; treasurer, W. R. B. Smyth.

NEWARK, N. J.—The Auxiliary Telephone Company has been incorporated here with a capital stock of \$100,000, divided into 1,000 shares at \$100 each. The concern will manufacture and deal in mechanism for telephonic use. The incorporators are Egbert A. Reynolds, of New York; Henry C. Ware, of Orange, N. J., and C. G. Colyer, of this city.

KORTRIGHT, N. Y.—The Davis Telephone Company of Kortright, has been incorporated. The company proposes to operate a telephone line between Delhi and other places in Delaware county, Worcester and other places in Otsego county, Cobleskill and other points in Schoharie county, the villages of Altamont, Voorheesville, Slingerlands and Delmar, Albany county, and the city of Albany; also to Binghamton and places in Chenango and Broome. The capital of the company is \$10,000, and the directors are Ferris E. Davis, James R. Penfield, of Delhi, and others.

COLUMBUS, O.—Articles of incorporation have been filed here for the East Telephone Company, of Jefferson county. Capital stock, \$6,000.

NIAGARA FALLS, ONTARIO—The Canadian Telephone Company has been incorporated by Geo. E. Foster, Robert Neil, Michael H. Ludwig, John Alexander, and others; capital stock, \$250,000.

TORONTO, ONT.—Oscar Wentworth Rogers has, associated with several other gentlemen, secured a charter for the Modern Telephone Company of Hamilton, Limited, with a share capital of \$300,000. The provisional directors are: Oscar Wentworth Rogers, Fritz Leoffler, of New York; Staunton King, William Asahel Johnson, Henry Alexander Drummond, Whitford Vandusen, Samuel Clarke Biggs and Joseph Boardman Scovell, all of Toronto.

WESTERLY, R. I.—The Westerly Automatic Telephone Company of Westerly, R. I., has been formed under a special act of the legislature, and has organized with the following board of directors: John Champ- lin, M. D., Albert B. Crafts, George C. Bartrum, William S. Slocum, Robert A. Sherman, George L. Stillman, Thomas J. Bannon and James A. Welch. The company has adopted the Strowger Automatic Telephone Exchange System, and has ordered one hundred telephones, and switchboards with an ultimate capacity of one thousand telephones. The first carload of material has arrived, and the work of installing the plant is now actively under way. Joseph B. Baker, of Boston, is consulting engineer, and Mr. O. S. Bowen, formerly with the New Bedford and Fall River companies, is superintendent of construction. It is hoped to open the exchange for service by September 1. It is proposed to extend the service to Watch Hill, Stonington, Noyes Beach and other surrounding towns in the spring.

MARBLE FALLS, TEX.—A movement has been set on foot by local capitalists to establish a factory for making telephone and telegraph arms and pins. The mountain cedar is to be utilized.

EAU CLAIRE, WIS.—The Ludington Telephone Company of Eau Claire; capital stock is \$3,000. Incorporators: E. G. Ingham, George M. Hudson, Wesley Baker and others.

Rates

WEST POINT, KY.—The Cumberland Telephone Company now charges a rate of \$1.00 for boxes in towns instead of \$1.50 per month, and 15 cents for connection to Louisville. The rates of the Home Company are 50 cents per month for boxes, and 5 cents connection to Louisville.

Elections

MONMOUTH, ILL.—The first annual meeting of the stockholders of the Monmouth Telephone Company, since its organization, has been held. W. P. Graham, president of the company presided, and R. Lahann, the secretary and manager of the company, presented his annual report of the fiscal year's business. The original plant started with 300 telephones July 1, 1901, and the capital stock was \$34,800. Additional telephones 296 in number, stock in hand, tools, bills payable and unsold bonds makes the total resources of the company July 1, 1902, \$59,103.45; the liabilities of the company are, \$9,256.30; gross business of the year, \$8,095.71; interest on bonds, \$2,750.00; earning capacity of plant, \$9,668.00. The election of a board of directors resulted in the selection of the old board as follows: W. P. Graham, R. Lahann, Jos. McQuiston, J. F. Searles, C. C. McClung, H. B. Smith, Geo. A. Schussler, J. E. Lanphere and Jas. Galbraith. The election of the new officers will take place at another meeting. An effort may be made to increase the capital stock to \$75,000, many of the stockholders believing that plan advisable, and a called meeting may be had to take action on the matter after the board meets and organizes.

THE WEEK'S MESSAGES Continued

SALEM, IND.—The annual meeting of stockholders of the Hoosier Telephone Company for election of directors has been held. The books of the secretary showed that the liabilities of the company on account of stock are \$29,500, on account of bills not due, supplies \$768.19, one half of which is for goods in transit. Indebtedness, nothing. The receipts for year ending July 1, 1902, were:

On account of earnings.....	\$5,985.05
Miscellaneous sources.....	876.96
Sales of stock.....	4,972.96

Total receipts..... \$11,834.97

The expenditures were:

For improvement and extension of system.....	\$6,341.27
For labor, including S. B. operators.....	4,066.56
For miscellaneous, including rents, fuel, lights, livery hire, etc.....	1,403.29

Total expenditure..... \$11,811.12

Including balance on hand July 1, 1901.

The balance in treasury July 1, 1902, is..... \$76.54

The fact that the earnings were over 20 per cent. of the capital stock should be accepted as evidence that the board of directors have managed the affairs of the company in the interest of the stockholders. Five members of the old board, and Austin Colglazier and Dr. H. C. Hobbs were unanimously elected directors for the ensuing year, Dr. J. S. McPheeters, of Hardinsburg, and Wm. Jack, of Martinsburg, declining to serve on account of inconvenience in attendance at monthly meetings. The organization of the new board resulted in the election of L. G. Davis, president; H. C. Hobbs, vice-president; G. M. Morris, secretary, and Wm. Rudder, treasurer.

WESTFIELD, IND.—The Independent Telephone Association of Hamilton and Boone Counties held a meeting here for the purpose of perfecting its organization and the election of officers. Nearly all of the telephone companies of the two counties were represented and the organization was placed upon a solid foundation for future benefits of its members. The association represents about 3,000 telephone subscribers. The following officers were elected for the ensuing term: H. F. Gallimore, of Zionsville, president; E. Hawkins, of Noblesville, vice-president; L. D. Cox, of Sheridan, secretary; M. E. Cox, of Westfield, treasurer. Jonathan Johnson, of Carmel; C. B. Jones, of Bakers Corner, and H. F. Gallimore, of Zionsville, were elected members of the executive board.

MT. PLEASANT, IA.—The following officers were elected at the annual meeting of the Mt. Pleasant Telephone Company: President, C. H. Brown; vice-president, R. S. Galer; secretary, H. G. Conger; treasurer, W. E. Keeler.

McCOMB, MISS.—At a recent meeting of stockholders of the Pike County Telephone Company, the following board of directors was elected: J. J. White, W. R. Caston and Dr. O. B. Quin. These officers were elected: O. B. Quin, president; W. R. Caston, vice-president; T. W. James, secretary and treasurer; L. E. Landers, superintendent. The office of general manager was discontinued. T. W. James will have charge of the finances and L. E. Landers will have charge of the business of the company, except such duties as have been assigned to the secretary and treasurer. During the past year the company has made wonderful progress. A large number of new telephones have been installed, and a great many more will be installed just as soon as they arrive, as the orders are already booked.

KAHOKA, MO.—The officers of the Kahoka Telephone and Construction Company are: President, T. L. Montgomery; manager, C. W. Stewart.

TRENTON, N. J.—The directors of the Inter-State Telephone Company of New Jersey held a meeting recently in Trenton, at which the resignation of Hugh S. Hemmel as president was accepted. Hon. C. W. Kline of Hazleton was unanimously elected president of the company. The company owns all the Independent plants in the State of New Jersey, except in Camden, and is completing the installation of one of the most complete plants in the world here. It also owns large plants in Paterson, Passaic, Elizabeth, Atlantic City, Burlington, Mt. Holly, Ocean City, Bordentown and other places.

FILLMORE, N. Y.—At the annual meeting of the stockholders of the Fillmore Telephone Company, the following were elected directors of the company: Charles Ricker, R. L. Richardson, C. J. Howden, Geo. W. Harding, W. G. Young, W. S. Mills and A. F. Bowen.

BUCYRUS, O.—The stockholders of the Bucyrus Telephone Company at their annual meeting elected the following directors: J. A. Chesney, E. Blair, Ed. C. Roehr, J. L. Assenheimer, Benjamin Shearer, H. S. Blair, J. C. F. Hull. The board of directors organized by electing the following officers: E. Blair, president; John A. Chesney, vice-president; J. C. F. Hull, secretary and treasurer. A. J. Unger was continued as manager. The company has finished a prosperous year and has completed the erection of 5,000 feet of cable. The line will be extended to Sulphur Springs, and three new pay stations will be established in the city.

GREENVILLE, TEX.—The stockholders of the Greenville Telephone Company at a recent meeting decided to increase the number of directors

from three to nine, and in furtherance of this action the following gentlemen were elected a board of directors: J. D. Middleton, J. B. Clayton, P. A. Balknight, J. M. Tisdal, R. D. Waddle, J. T. Young, C. B. Jones, L. A. Clark, Frank Owen. The newly chosen board of directors met immediately and elected the following officers: President, L. A. Clark; secretary, C. B. Jones; treasurer and general manager, J. T. Young. The company proposes to go right ahead with improvements on the local exchange.

NORTH YAKIMA, WASH.—The Christian Co-operative Telephone Company has elected directors for the ensuing year. They are S. J. Harrison, R. D. Young, J. B. George, William LeMay and William Hitchcock, all of Sunnyside. The company will soon begin the work of constructing a line to this city.

Franchises

BERKELEY, CAL.—An application for a franchise was received at the Board of Town Trustees' meeting from the Independent Telephone Company, of which A. J. Snyder, of Oakland, is secretary. In the petition to the Berkeley Board the company asked for a franchise of fifty years, and the privilege of erecting poles and wire on the streets for telephone and telegraph service. The matter has been referred to the Town Attorney and the Street Committee.

CANTON, ILL.—As a result of the long-drawn-out and very bitter fight between the citizens of Canton and the Central Union Telephone Company, the Independent telephone company has been granted a franchise to erect lines and conduct its business within the corporate limits of Canton. The new concern has received its articles of incorporation, and is known as the Canton Home Telephone Company.

HAVANA, ILL.—The City Council has granted a 15-year franchise to the American Construction Company, of Chicago, to install a new local telephone exchange to be completed and in operation within the next 120 days. This company has installed local exchanges throughout this state and several neighboring towns.

MASON CITY, ILL.—The City Council has granted the Mason City Telephone Company a franchise to erect telephone poles and stretch wires in this city. At present service is given to twenty telephones south of Teheran and west of Mason City, and in a few days connection will be made with Easton and surrounding country. It is expected to make connections in the near future by long-distance service to Pekin, Peoria, Bloomington, Decatur, Springfield, Lincoln and other intermediate towns and cities. Just as soon as the switchboard and cable arrive and can be put up the central office for Mason City will be put in operation. The switchboard will be prepared to operate twelve country lines and sixty city telephones. The officers of the Mason City Mutual Telephone Company are: Dr. C. A. Stone, president; W. A. Grandy, treasurer; J. F. Culp, secretary. The stockholders are as follows: Dr. C. W. Cargill, Dr. J. W. Spear, Chenewith & McHarry, Ely & Reason, Chambers & Sons, George N. Kern, Lud Davis, Albert Cross and J. S. McElheny.

WATSEKA, ILL.—Dr. N. I. Stringer has been granted a telephone franchise. He will connect his line with the other Independent lines and the association will be called the Agricultural Telephone Exchange.

CHURUBUSCO, IND.—The Whitley County Commissioners have granted the Churubusco Telephone Company a fifty-year franchise. The company had a franchise, but as extensions are being made it became necessary to have a new one.

WELLINGTON, KAN.—The City Council has granted a franchise to John T. Stewart, Geo. T. Pitts, Ed. Hackney and T. F. Randolph, doing business under the name of the Home Telephone Company, to use the streets and alleys for the poles and wires and to operate a rural telephone system and city exchange also, if they so desire. The County Commissioners granted the same parties the use of the county roads for the same purpose. In both cases provision was made for the company assuming all risk for injury or damage to private parties. The franchise from the city provides for the giving to the city of the use of a number of telephones in lieu of any occupation tax. It is expected that the new company will push the matter of putting in their system and that it will be connected with the various Independent telephone exchanges throughout the county. The service will probably cost each subscriber about \$1.25 a month. The first lines built will probably be northwest and southeast from this city.

HANNIBAL, MO.—The City Council has passed an ordinance giving the Miller Township and Hannibal Telephone Company a franchise to install a telephone exchange in the city in opposition to the Bell Company. Under the terms of the franchise the city is to receive telephones free of charge and \$500 and 5 per cent rental for all telephones installed. The franchise is for twenty-one years, and according to the stipulation the company is not to charge to exceed \$18 a year rental for residence telephones and \$30 a year for telephones in business houses.

MEXICO, MO.—Frank Bufum, of the La Crosse Lumber Company, will ask the City Council to grant him a franchise to put a new telephone system in Mexico.

THE WEEK'S MESSAGES *Continued.*

BILLINGS, MONT.—At a recent meeting of the Council L. L. Moffet and his associates were granted a franchise to erect and maintain a telephone exchange in this city, the franchise to expire Oct. 3, 1909, at the same time the franchise of the existing Billings Telephone Company expires.

DEPEW, N. Y.—The village attorney has been instructed to draw up a franchise and draft the same for the Haines Telephone Company to operate in this village.

MECHANICSVILLE, N. Y.—At the regular meeting of the village Board, Messrs. Lenox and Burke, representing the Saratoga Telephone and Telegraph Company, presented a petition asking for a franchise to set poles and string wires on certain streets in the village. The franchise was granted.

GREEN CAMP, O.—Fred. E. Guthrey and D. M. Odaffer have secured a franchise for the Marion County Telephone Company to set poles and run a line into this village. An exchange will be put in here at once, and the work of running the line is already under headway.

Underground

COHOES, N. Y.—The Cohoes and Waterford Home Telephone Company will commence work soon to lay its wires in the business section underground.

Competition

ITHACA, N. Y.—The contract for furnishing the city offices with telephonic service has been unanimously awarded to the Ithaca Telephone Company for the term of three years. The new telephone company is a competitor of the New York and Pennsylvania Company, and won the contract by underbidding the old concern. The bid of the Ithaca Telephone Company was to furnish the city with fifteen telephones for one year free of charge and to charge \$106.50 a year for the following two years. The bid of the Bell Company was to furnish the fifteen telephones for \$168 a year.

JAMESTOWN, N. Y.—The new Home Telephone Company is having a fight in the court with the Bell Company. The latter has had a monopoly of the business so long that it comes hard to have opposition.

Combinations

CHICAGO, ILL.—The Inter-State Independent Telephone and Telegraph Company, with its main office here, has purchased all the Independent lines of Illinois that were controlled by Hank Evans. This includes the White-side Telephone Company, the Independent systems of Kane, Du Page and Will counties, including the towns of Elgin, Aurora, Naperville and Joliet, the Springfield system and that at Oskaloosa, Iowa. The Inter-State Company was incorporated last winter with an authorized capital of \$5,000,000, and the purpose is to secure control of the Independent companies of Illinois, with a view to operate a long-distance service out of Chicago and also for the general improvement of the service so as to better compete with the Bell Company.

DANVILLE, KY.—The Bastin Telephone Company has bought the J. S. Van Winkle Telephone lines in Boyle County. This gives that company an exchange at Danville, and also enables the patrons of the Lincoln County Telephone Company of Interior to talk to this city.

KEYSER, W. VA.—The Gordon Telephone Company, through its attorney, has sold its line from Keyser to Moorefield via Burlington and Romney, to Dr. F. L. Baker, of Burlington, and George T. Leatherman, of Old Fields.

Construction

FULLERTON, CAL.—The telephone business is increasing very rapidly and the company has expended over \$2,500 in extending and improving the service during the past few weeks. A second line to Placentia and a new line to Yorba from Fullerton have just been completed.

LA VETA, COL.—A telephone line is now in course of construction between this place and Alamosa.

HULL, ILL.—Messrs. Buttz and Breckenridge are building a telephone line from this place to Shepherd and will soon have it completed. Their intention is to cross the river, possibly on the bridge, and if not they will string the wires across by cable.

NORMAL, ILL.—The Home Telephone Company has a force of linemen at work in Normal stringing a large cable from its central office to take the place of the many telephone wires leading to the northeastern part of town.

STONINGTON, ILL.—The Home Telephone Company is now ready for the rebuilding of its plant, which is to begin shortly. None of the material is here, but it is being turned out in Chicago, and as soon as sufficient quantity is on hand a shipment will be made and work commenced here.

BRAZIL, IND.—The new Citizens' Telephone Company of this city is receiving material for the construction of their exchange here, and expect to

have it in operation inside of ninety days. This company is composed of local capital, and will install an exclusive single party line, using the most modern and up-to-date apparatus. The switchboard has a capacity of three thousand lines, five hundred of which will be put in at once.

NORTHWOOD, IA.—A meeting of the directors of the Northwood Telephone Company has been held at which it was decided to construct a line west to Sombra, and farther if wanted, and also another line to Gordonsville. Seventeen farm houses will be supplied between Northwood and Gordonsville, and twenty-three have agreed to take telephones on the line west from town. Many others, living a short distance from the proposed lines, want to be connected, and they will be accommodated, if possible. The addition of these new telephones will necessitate a larger switchboard at the central office, and a committee has been appointed to look after that. It is more than probable that fully 100 farmers' homes will be connected with the Northwood exchange before winter. Every resident along the Gordonsville road—renters as well as land owners—will patronize the line. If it is possible to raise the money a line will also be built east into Deer Creek, to the State line Creamery, out through "Macville." Some of the farmers are working to have the Sombra line extended through to Joice village. The farmers are interested and many of them are taking stock in the company.

PEIRO, IA.—The Peiro Telephone Company plans to operate a telephone exchange at Hornick. Its lines already connect Peiro, Climbing Hill and Holly Springs.

PRESTON, IA.—Frank Zinnel, of Savanna, Ill.; C. J. Storm and F. V. Potter, of Preston, have been in Maquoketa recently to confer with the Maquoketa Telephone Company with regard to a new telephone exchange system at Preston and telephone lines to connect therewith.

BELL PLAINE, KANS.—The Independent telephone exchange here is nearly completed. A toll line will be built to Peck.

OXFORD, KAN.—Oxford is to have a telephone exchange. Already over fifty subscribers to the Oxford exchange have been secured. This will guarantee its speedy completion and success. Harry Caman, manager of the Winfield Independent Telephone Company, will have supervision of the Oxford company's plant and its construction.

BATH, ME.—A six-station switchboard is being installed in the new exchange of the telephone company.

SNOW HILL, MD.—The Selbyville Telephone Company will extend its lines to Snow Hill and thence to the corporate limits of Pocomoke City by way of Stockton and Girdletree; and the Somerset Telephone Company will extend its wires through Shelltown, Rebooth and Marumco to the corporate limits of Pocomoke City, where it will join the Pocomoke Telephone Company's wires. The Diamond State Telephone Company, which owns the plant now in operation in Snow Hill, has leased an office and will begin work on the new exchange. The entire system will be remodeled and much improved. When the work is completed it will give Snow Hill direct connection by copper wire metallic circuit direct with Baltimore, Philadelphia and New York and general long-distance service. The Diamond State has extended its lines to Ocean City.

BANCROFT, MICH.—The Union Telephone Company has started an exchange in Bancroft. Between twenty and thirty subscribers have so far asked for connections.

NILES, MICH.—Theodore Thorward, president of the South Bend Home Telephone Company, of South Bend, Ind., has arranged for a toll line from South Bend to Niles and thence to Benton Harbor and St. Joseph, Mich. The City Council has granted a franchise to the company, giving it permission to use the streets of the city for the necessary poles and equipment. The company will establish a toll station at Niles and will operate two long-distance circuits, one from South Bend to Niles for service between the two cities and the other from South Bend to St. Joseph and Benton Harbor, giving direct connection. From St. Joseph, Grand Rapids, Jackson, Detroit, Saginaw and various other points in Michigan may be reached.

PONTIAC, MICH.—Arrangements have been completed with the local telephone company under which the Union Telephone Company will run a copper wire into this city and ultimately to Detroit.

ALBERT LEA, MINN.—The Glenville Telephone Company has its wires about strung to this city, and it is expected connection will be made soon. There is a network of wires over Shell Rock township and many farmers have been supplied. Connection will be made with the line from Northwood and the system made as complete as possible.

FERGUS FALLS, MINN.—The Fergus Telephone Company will extend its lines to Parker's Prairie and build an exchange there.

HARDIN, MO.—An Independent telephone line is being built from this town to Norborne, which will give the two exchanges direct communication. A number of subscribers have already been obtained.

YORK, NEB.—The Independent Telephone Company has just built a line through New York Township and a large number of farmers have subscribed for telephones. The Independent company now has connections

THE WEEK'S MESSAGES *Continued*

with Waco, Benedict, Bradshaw and Arborville, and in a short time will have instruments in every township in York County.

CAZENOVIA, N. Y.—The recently organized local telephone company at Cazenovia contemplates extending its lines to Canastota and Syracuse, Nelson, Erieville, Eaton, West Eaton and Hamilton, Shed's Corners, South Otselec and Georgetown, Perryville, Clockville, Chittenango, Lakeport, Bridgeport, Oran, Manlius, Delphi, Pompey Center, Pompey Hill, Chittenango Falls and Fenner.

SCHUYLER LAKE, N. Y.—A telephone line is to be established from here to Burlington Flats.

UTICA, N. Y.—The managers of the Inter-State Telephone Company are contemplating the advisability of extending their line from Fairfield to Norway.

WARSAW, N. Y.—A movement is on foot among the farmers between Warsaw and Orangeville to construct a telephone line to this village. The town of Orangeville is the only one in the county that is not in telephonic communication with the county seat. The Home Telephone Company, which was granted a franchise about one year ago, is installing instruments daily and has its exchange in operation. In order to compete with the Bell Company, this company places an instrument in the business places and houses, allowing the use of it for one year free of charge, after which time it can be removed without cost, or a satisfactory tariff agreed upon between the parties.

DEVIL'S LAKE, N. D.—The work of constructing the new long-distance telephone line between Devil's Lake and Minot has been commenced.

HOPE, N. D.—The Union Telephone Company, of Hope, is improving its plant.

NEW GLASGOW, N. S.—The Nova Scotia Telephone Company has commenced to build its new line from this place to Sydney. The work is being pushed forward rapidly, quite a distance being already completed. The line will probably be ready for business as far as Antigonish in about six weeks' time. This line will be the completing link between Sydney and Boston.

GALION, O.—The Galion Telephone Company is preparing to put in a large amount of cable and otherwise improve the local plant. The company has over 700 telephones in use.

NEW RICHMOND, O.—The City and Suburban Telegraph Association has just completed the erection of a new exchange here, opening the office with a list of nearly 100 subscribers. The work was in charge of Manager Charles Slade, who has recently been sent from the main office to superintend the installment of a number of small offices in Clermont County. Arrangements are also completed for the opening of an exchange at Milford within a few weeks. Quite a number of long-distance lines have been extended into Clermont County, and places which for years were isolated as far as telephone connection was concerned, are now connected with the local and long-distance lines. At Goshen an automatic switchboard of a dozen lines has been installed.

HAMBURG, PA.—The Consolidated Telephone Company is stringing the wires of its line from Reading to Hamburg.

PHILADELPHIA, PA.—The Keystone Telephone Company will build another exchange. The proposed structure will be constructed of brick, stone and terra cotta. It will be three stories high, and will measure 40x92 feet and will be similar in style to the other exchanges in different sections of the city.

WARRINGTON, PA.—The telephone line to Warrington is being rapidly constructed. It is already completed from Warminster to Neshaminy. Subscribers' lines will be built to Willow Grove.

WASHINGTON, PA.—The new Federal Telephone Company is pushing its lines to completion as rapidly as possible, and in a short time will have the connections made to all local points in this territory. It has a large gang of men at work closing the gap in the toll line between Washington and Linden, which, when finished, will give Washington subscribers connection with all towns up the Monongahela Valley from Homestead to Brownsville, also towns on the Pennsylvania Railroad east of Pittsburg. Arrangements have also been made to give connection to Waynesburg and other points in Greene County. All Washington subscribers will have free service with subscribers in Canonsburg, Houston, Finleyville and intermediate stations. The rates of the new company are very reasonable, and there is no doubt but what the service will prove satisfactory. J. D. McQueen is district manager. J. E. Crockett is superintendent of construction.

ELGIN, TEX.—W. O. Bennett will soon have his telephone line completed from Elgin to Beakiss. This line will be of great convenience to the county, as most of the farmers on the line are putting in telephones. The Commercial Telephone Company has its new office finished.

ST. ALBANS, VT.—The Franklin County Telephone Company is building a line to Swanton which will soon be completed.

OAKESDALE, WASH.—The Granite Hill Telephone Company has completed its telephone line from Thornton to Oakesdale. The company was organized by the farmers living between the two towns. Efforts are now

being made to install a local exchange in Oakesdale, and \$400 has already been subscribed. This section of the Palouse country was served with the barb wire system during the past year, but it proved unsatisfactory and the farmers, once having known the benefits of a telephone, have substituted the high line for the barb wire. Oakesdale has two farmer line systems and one on barb wire. Another line will be built soon to tap the country north of town.

HARTFORD, WIS.—The Wisconsin Telephone Company is extending its lines from this place to Mayville, serving the towns of Rubicon, Woodland, Metallic Ridge and Iron Mountain with a metallic circuit.

Miscellaneous

BLUE RIDGE, GA.—The Blue Ridge Telephone Company, of which John H. Carter is president, is now in active working order and is furnishing the residents of Blue Ridge and the neighboring towns with telephone service. About 60 telephones have already been put in here, five or ten at Mineral Bluff, several at McCays, Tenn., and about 15 at Morganton. Besides these about 25 or 30 more have been ordered.

CLOUD, IA.—The Marion County Mutual Telephone Company, which runs through here from Newbern to Knoxville, has been completed.

OGDEN, IA.—The Ogden Telephone Company, this season, so far, has built thirty miles of pole line and strung about seventy-five miles of wire.

HERMANN, MO.—The direct telephone line from Hermann to Owensville has been opened to service. Subscribers to the Drake-Hermann line have free use of the new line as far as Drake, but must pay a fee of ten cents for messages to Owensville and points south of Drake.

JEFFERSON CITY, MO.—The State Board of Equalization has adopted the following resolution regarding telephone companies:

"Resolved, By the State Board of Equalization, that the telephone companies doing business in this State be requested at once to furnish the Board with the following information:

"First, the number of miles of conduits used, owned and operated by said companies on June 1, 1901; the location of the same and the cost thereof, and the miles of wire laid therein.

"Second, the number of telephones in use by the company on said date and the cost thereof, the number of switchboards, and the cost thereof, and what proportion of the line is in Missouri, and what elsewhere.

"Third, the proportion of the cost of the plant in Missouri to the cost of the whole plant."

NAPLES, N. Y.—The local telephone exchange is now in active operation here.

ONEONTA, N. Y.—The Oneonta Telephone Company has completed a double copper circuit to West Oneonta, where it makes connection with the Morris line, and now has exclusive service with the latter and intermediate places.

PENN YAN, N. Y.—The Board of Trustees has appointed a committee to have charge of the locating of the poles of the Inter-Ocean Telephone Company, which will soon bring its lines into the village.

SHORTSVILLE, N. Y.—The InterOcean Telephone Company is securing leases of land through this section for the long-distance telephone from Cleveland, via Buffalo, through to the East. This company will probably furnish service to the many Independent telephone lines throughout this section.

TROY, N. Y.—The Rensselaer Telephone and Telegraph Company has commenced the operation of about 400 lines in Troy. There are about 1,200 in all, and it is expected that the entire number will be in operation in a very short time.

PORTSMOUTH, O.—The Portsmouth Telephone Company, of which T. B. Newman is manager, is establishing exchanges over the entire county.

BLOOMSBURG, PA.—Bloomsburg is now connected by telephone with Harrisburg, the United Telephone and Telegraph Company having completed a connection of their lines between Millersburg and Harrisburg.

GIRARDVILLE, PA.—At the Philadelphia and Reading collieries the telephone system is about to be introduced to take the place of the telegraph. One hundred and fifty men are now employed stringing wires and making the necessary changes for the operation of the new system.

WINDBER, PA.—The Somerset Telephone Company has installed a new exchange here, the one at Jenners having been abandoned.

CHATTANOOGA, TENN.—A number of parties have been here quietly looking around, and making special inquiries as to the telephone system, the city ordinances regulating the same, etc. The visitors have not made public announcement of their plans, but it is learned that there is a movement on foot for an Independent telephone system, and that the City Council will probably be asked for necessary franchises at an early date. One of the parties interested in the movement was seen in consultation with a leading local attorney, and it is evident that something is up. It is said a large company that makes a specialty of building Independent telephone systems is back of the movement, and that when all the preliminaries here are settled the matter will be pushed vigorously.

THE WEEKS MESSAGES *Continued*

LONE TREE, TEXAS.—The Lone Tree telephone exchange is now in operation. About thirty telephones are connected and more will be added each week. Inducements are held out to farmers to build lines and connect with the switchboard. J. M. Lee is president of the company; Dr. Day, vice-president, and Dr. H. B. Brock, secretary.

RANDOLPH, VT.—It is proposed to establish a People's Telephone line here and a large number of those interested met and appointed a committee consisting of Dr. F. C. Angell, H. W. McIntyre and N. W. McCullom, to look into the matter of establishing an exchange at this place.

Personal

LEXINGTON, KY.—Mr. J. K. Johnson has been made manager of the Fayette Home Telephone Company. He is one of the most competent and efficient telephone managers in this section of the country. He has had an experience of seven years in the business, and for almost this entire time was in the employ of the Central Union Telephone Company. With this company he was first employed as special agent, and afterwards as manager, and there gained an acquaintance with the business which is now serving him to such excellent purpose.

MEXICO, MO.—The R. V. Montague Bond and Investment Company, of Kansas City, which recently purchased the Mexico Telephone Company, has placed William Summers, of Bloomington, Ill., in charge as resident manager, and A. B. Chance, of Centralia, as general manager.

ORANGE, TEX.—Frank Frazee has been appointed manager of the Orange Telephone Company. Mr. Frazee is a practical electrician, having been engaged in the electrical business at Tyler. He is well known to all the principal stockholders in the company, and comes to Orange, where he will now reside permanently, well recommended. Mr. Frazee holds a very responsible position, which he will unquestionably fill with credit to himself and satisfaction to the community.

TELEPHONES PRO RATA

SOME interesting statistics on the use of telephones have recently been prepared. They are as follows and show the cities of the world having the largest number of subscribers in proportion to population:

Trenton, N. J., has one telephone to every 21 people.
St. Petersburg, Russia, has one telephone to every 283 people.
Vienna, Austria, has one to every 120 people.
London, England, has one to every 111 people.
Philadelphia, Pa., has one to every 96 people.
Paris, France, has one to every 82 people.
Chicago, Ill., has one to every 64 people.
New York City has one to every 49 people.
Stockholm, Sweden, has one to every 13 people.

THAT THERE CENTRAL TELEPHONE GIRL

Mr. B. F. Reuther, of the Dunkirk Home Telephone Company, Dunkirk, N. Y., besides being a business man is a poet of no mean calibre. When he strikes a fractious prospective subscriber to his telephone system he produces a small, neatly engraved business card, on the reverse side of which is printed the following:

"Some condemn her, others damn her,
Some make love and try to flirt;
Some will court her, some report her,
Others try to do her dirt;
Yet she's good; we all respect her;
She's a jewel in the business whirl;
We should bless her and caress her—
That there Telephone Central Girl."

TRADE NOTES.

THE H. B. CAMP COMPANY, pioneer in the manufacture of conduits for telephone and other wires, has established its general sales office at No. 170 Broadway, New York, under the direction of H. M. Keasbey, the vice-president of the company. Mr. Keasbey is one of the most experienced men in the clay business, having for the last twenty years, been actively engaged in that industry. He is known to the trade from the Atlantic to the Pacific. The factories will be continued at Greentown, Ohio, where the company has one of the greatest plants in the world.

The Camp Company, in addition to the old Camp single duct conduits, has gone into the manufacture of multiple ducts for which it has built up a large demand. The company now has dealings with many important telephone and electric companies in

the country. Among the telephone companies for which it is now furnishing conduits are the Home Telephone Company, of Dayton, O.; Hamilton Home Telephone Company, Hamilton, O.; Black River Telephone Company, Loraine, O., and the Missouri Bell Telephone Company. It is also furnishing conduits for the Union Subway, New York City; Metropolitan Street Railway Company, New York City; Milwaukee Railway and Light Company, Milwaukee, and the North Jersey Traction Company, of Newark.

Under the direction of Mr. Keasbey the business of the company has been thoroughly organized on a practical business basis, and the best methods for handling its large trade have been adopted.

The company makes it a special consideration in all contracts to guarantee prompt delivery and flawless goods.

HUBBARD & Co., Pittsburg, the well-known manufacturers and jobbers of telephone construction materials, were represented at the Rochester meeting to organize the New York State Independent Telephone Association by Mr. Carl Seyler. He took every opportunity to interest the New York operators in the goods of his firm. New York State is a rich field for manufacturers of telephone goods. There is lots of construction and building going on in the State.

THE AMERICAN ELECTRIC TELEPHONE COMPANY, Chicago, has received an order from the Topeka Independent Telephone Company, of Topeka, Kas., for an additional equipment switchboard for 500 subscribers' lines, to be installed immediately. The Topeka Independent company has a splendid new central energy system, and this is the third increase made inside of three months. All of which goes to show the appreciation by the public of the efforts made by Independent companies who give the best service possible.

THE KELLOGG SWITCHBOARD AND SUPPLY COMPANY has recently closed a contract with the Northern Construction Company, of Bryan, Ohio, for a common battery multiple switchboard for Vincennes, Ind., having 1,500 lines ultimate capacity and a framework large enough for 3,000 lines. The present equipment will contain 640 lines. The switchboard will consist of two 6-panel 3-position sections. The exposed cabinet work, including the cable turning section and movable end panels, will be of selected mahogany of a dead finish. Included in this contract is 600 standard common battery wall telephones, quarter sawed oak woodwork and concealed line binding posts, also all necessary power apparatus, main and intermediate distributing frames, relay racks and sneak current arrester equipment.

PLANTS FOR SALE

TELEPHONE PLANT FOR SALE—160 telephones, 100 miles of toll lines; excellent opportunity for extending business; will sell for \$12,000; pays 15 per cent. net on this amount. Address TELEPHONE CO., care of AMERICAN TELEPHONE JOURNAL.

WANTED

POSITION with Electrical or Telephone Manufacturing Company, by an expert battery-maker Twenty-two years old; good references furnished. THOS. A. LOUGHRAN, JR., 28 Romaine Avenue, Jersey City, N. J.

WANTED.—Position as wire chief or manager of an exchange of 1,500 or 2,000 subscribers in a clean Western town or city by a married man of temperate habits, with twelve years experience with the Bell Co., but now taking care of an exchange district with 1,500 subscribers for an Independent Co. Can give good references. Address L. M., AMERICAN TELEPHONE JOURNAL.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISSELL CO., Toledo, Ohio.

A FEW more men wanted to take advantage of our gilt-edged offer: 5,000 Toll Tickets printed, \$1.75. Independent Telephone Printers: THE SUN-PRESS, Stockbridge, Mich.

The American Telephone Journal

VOLUME VI

SATURDAY, AUGUST 9, 1902

NUMBER 6

THE TELEPHONE IN RAILWAY SERVICE

By L. B. FOLEY, Superintendent Telegraph, Delaware, Lackawanna and Western Ry.

WOULD the railway systems of this country have discontinued the use of telephones in their operation had telegraphy been invented after the telephone? Had the telephone been invented first and put in general use before we had the telegraph, would the Morse system have been adopted in its place? Any person who knows how superior telephony is to telegraphy will say "No" emphatically to both questions. Undoubtedly had railroads been able to install telephones and use them in train dispatching and the transmission of orders, they never would have changed to the telegraph. The telegraph never would have been used at all in railroad work. Telephony has been in use on several large railroad systems in the past few years. But it has not been found as efficient as the telegraph. The reason for this is very simple. Whereas there are from five to twenty circuits for sending telegraphic messages, in nearly every instance where the telephone has been used in railroad work there has been but one telephone circuit. If this one telephone circuit is interrupted, the telephone is out of commission, and the telegraph has to be relied on. If there was only one telegraph circuit and many telephonic circuits, if this one telegraph wire should break down, would not the telephone have to be relied on exclusively? Most assuredly it would.

There is a natural prejudice amongst some old railroad employes against the telephone. They have grown up in the service, and have during all their railroad experience been accustomed to the telegraph as a means of communication. They feel that the telegraph has been entirely satisfactory in years past, and that it is good enough for the future. It would be a step backwards, according to their viewpoint, to substitute telephones for the telegraph. But, fortunately, there is another element in railroading—the younger element—and, as they are practically in control of railroad systems in these days of progress, it seems certain that every railroad in this country will, in the course of

We have at present three hundred and forty miles of telephone circuits, handling ordinary routine business that three or four years ago was done exclusively by telegraph. The system we use is simple in the extreme. It is operated in the same manner as the long-distance service of the telephone companies. We have a through trunk line from New York City to Elmira, N. Y., and expect soon to have this extended to Buffalo, a distance of four hundred and ten miles. Besides this trunk line of two hundred and sixty miles to Elmira, we have on each division of the road, short lines radiating in all directions and connecting the different

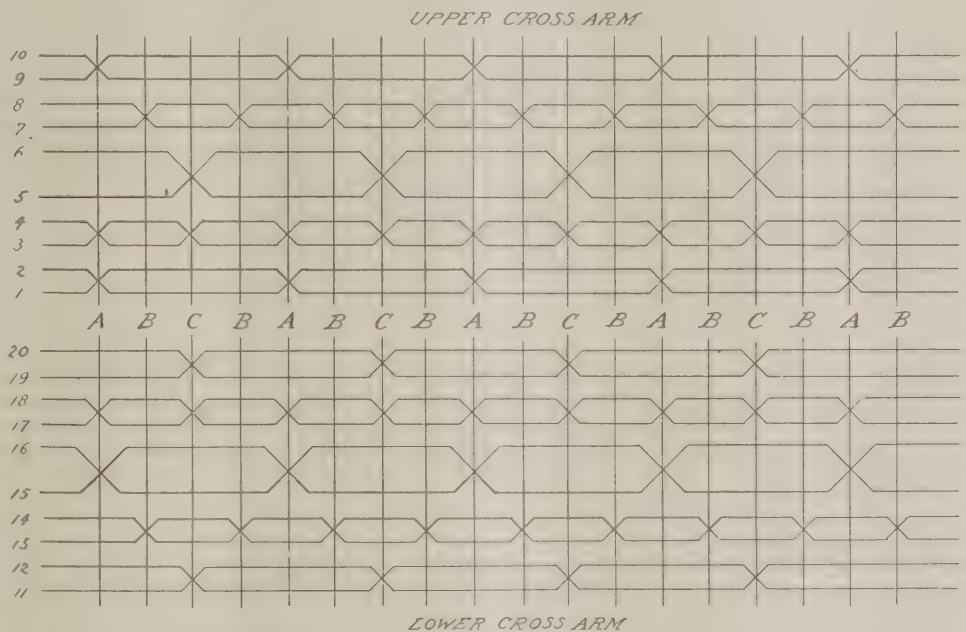
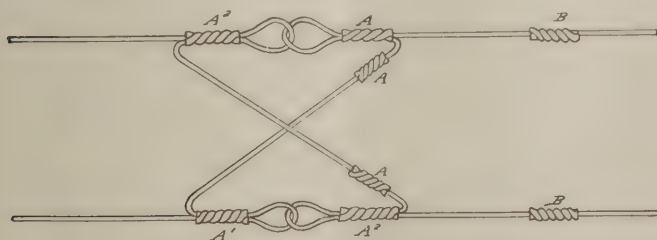


FIG. 1.

This drawing shows the general method of transposing a twenty-wire line. Measure a distance of 1,300 feet from the first open-wire fixture and mark the pole nearest the point so measured "A." Measure a second distance of 1,300 feet from the first 1,300-foot pole and mark the pole nearest this point "B." Continue in this manner to measure off all poles 1,300 feet apart, marking poles as shown. When the pole line contains more than two cross-arms, transpose 3d, 5th, 7th, etc., cross-arms like the first, and transpose the 4th, 6th, 8th, 10th, etc., like the second.



A² Half Sleeves A' Top of Glass
B Whole A² Bottom

FIG. 2.

the next few years, be equipped exclusively with telephonic communication. In my opinion this is bound to come.

In view of all this, it may prove interesting to know what the Delaware, Lackawanna & Western has accomplished and is doing.

local stations. It is apparent that should the trunk line be used to communicate between all the stations on the road, it would be kept so busy all the time that one could not get communication with stations widely separated from each other. Our telephone circuits are placed on the poles with the telegraph wires. This results in a noisy line, but the noise is avoided and almost eliminated by the system of transposition shown in Figs. 1, 2 and 3. At principal points on the line we have installed private branch exchanges. All business coming in or going out from one division to another is handled by these exchanges. One bright boy is able to do the work performed by a number of telegraph operators. And he can do it in much less time. To show this, let us see how the two modes of communication operate. First the telegraph: An agent, at a small station along the line, wishes to communicate with our general passenger agent's office or general freight office in regard to rates, billing instructions or other business. He writes his message on a blank, involving considerable time and labor to him. He is also obliged to condense his request for information into as few words as possible, not being able to give a full explanation. Next, he sends it to the telegraph office, where an operator gets it, calls another operator at the other end of the wire, and then the first one, slowly and laboriously, ticks off the message, which is again written by the receiving operator. Next, a messenger boy takes

the message and carries it to the party addressed. He in turn reads it, writes an answer and sends it back in the same manner. All this involves considerable labor and time. Now let us see how the same agent can communicate with the general office by telephone. He simply goes to the telephone, calls for the "general office, New York," and the exchange operators do the rest. They proceed to build up the connection in exactly the same manner that toll line connections are secured, and in a few minutes the agent miles away is put in personal communication with the general officers of the company, to whom he may make a lengthy explanation, if necessary, and get a reply instantaneously.

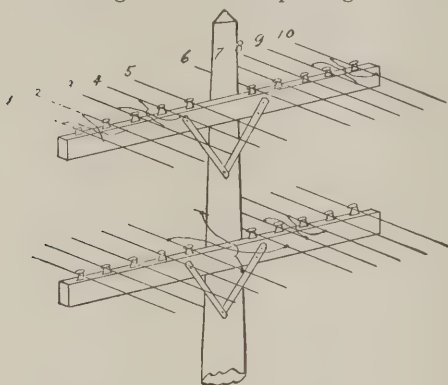
The uses of the telephone are not limited. It can be used in every case that the telegraph can, and in many in which the telegraph is an impossibility. Of course, at the present time we do the bulk of our business by telegraph, but in a few years this will all be changed. One of the new uses of the telephone is in handling train orders. A second-class train may be waiting on a siding for a passenger train. The conductor of the former, by telephoning to the dispatcher's office, can obtain orders to proceed after setting the proper signals, if he finds he can reach another siding ahead of the passenger train. This was impossible

entirely cut off. Now, by using telephones any one could receive or transmit communications. A conductor of a train could receive his orders, and in turn give them to the engineer. Or he could personally report to the proper official any trouble or breakdown or give or receive information of any kind without the necessity of employing a special operator.

Our mining department has its own telephone system, comprising about fifty miles of telephone circuits, which connect with our transportation department by means of a branch exchange located at Scranton. Each of our collieries can be reached by the superintendent of mines from his office. He can communicate direct with the outside foreman or with the mining boss underneath the ground.

The telephone system is invaluable to the mining department, as it enables prompt distribution of cars, which is very important when cars are scarce. A colliery may break down and mining have to be suspended for several hours. By telephoning to the proper official, cars en route to that mine can be diverted to another.

There are many advantages and combinations that can be effected by the telephone that are not possible with the telegraph.



Pole like this 1,300 feet from starting point and every 5,200 feet after.

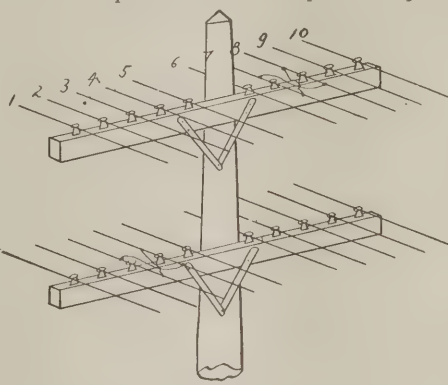
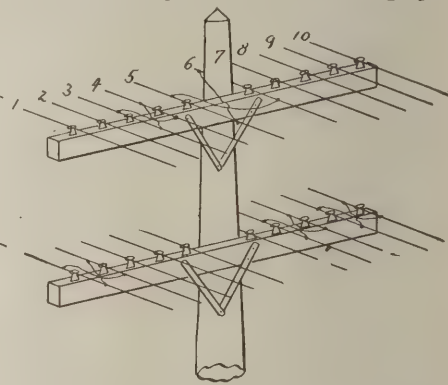


FIG. 3.
Pole like this 2,600 feet from starting point and every 2,600 feet after.



Pole like this 3,900 feet from starting point and every 5,200 feet after.

before the advent of the telephone. Often a second-class train was delayed on a siding for hours, waiting for a passenger train to pass. At each siding an iron box is placed on a telegraph pole, enclosing a telephone set. This box can be unlocked with an ordinary switch key, one of which every trainman is obliged to carry. Thus trainmen can instantly get into communication from any point on the line with the dispatcher's office.

The general superintendent's car is equipped with a telephone set, having a cord and plug arrangement by which connection can be made at any time with the line wires. This enables the general superintendent, no matter where he may be, to keep in close personal touch with every detail of the work.

One of the strongest reasons why every railroad system is anxious to install telephones is the fact that any one can use a telephone. In many small towns, where we have stations, there is only one telegraph operator. The communication with this place depends entirely on his being at his post. Should he be ill or meet with an accident, communication with his station would be

The Lackawanna could scarcely do without the telephone now. If it should be abandoned, our line would be seriously crippled. I have often asked our men how they got along before we had telephones, and they invariably say they don't see how they handled the business. We are daily receiving requests for more telephones, and are furnishing them as fast as we can construct the necessary wires.

These figures show how great a labor and time saver the telephone is over the telegraph. With six hundred miles of telephone line in use on our road, we handle the same number of messages that we handle on three thousand miles of telegraph lines. One telephone employee, at a salary of \$30 a month, handles as many calls as six or eight telegraph operators would take care of at \$75 a month each. The middle man who receives and again transmits messages, is entirely dispensed with. Communication can be had personally between the parties interested. The general officers of the company frequently hold important conferences with each other, although many miles apart.

TROUBLE WITH WIRE TAPPERS

EVERY wire chief in the telephone business has probably at some time had trouble with wire tappers. Some people, when they pay a certain stipulated sum for telephone service, are afraid they are not getting their money's worth in simply having communication with every other subscriber in the town. They resort to all sorts of tricks to get more work out of their instruments.

A trouble man in St. Paul has told a reporter of the *Pioneer Press* of that city of some of his experiences in that connection.

"Only the other day," he continued, "I was sent to look after a line on which the operator had got frequent signals, but was unable to get any reply from the patron. The electric light would flash up on the board, and when the operator would answer she would find that there was no one at the other end of the line.

"When I got to the other end of the line I found that the telephone was in good order, and I started along the line to look for the trouble. A little way from the instrument I found that the

wire had been tapped, and a connection had been made with another wire that led to the front door bell. The wire had been tapped to secure current from the telephone office battery to operate the doorbell. The result was that every time any one rang the doorbell, they also signaled the telephone operator.

"Another job that was handed me was a telephone line that was so weak that the voices could hardly be heard. There were four patrons on this line, and they were reporting that the telephone was worthless. I examined two of the instruments and the connections, and found them all right, but in the third house is where the trouble was. They had hired an electrician, who tapped the battery wire and then wired the entire house. There was a bell in the bathroom for the wife, a bell in the man's room, another in the basement for the servant, and a fourth in the barn for the coachman. Every time the call came in, it sounded on all of these bells. This took so much of the current that there was not enough left to operate the line."

ing this voucher is notified to see that payment is received before or at time of signing. If
payment, it is done at signer's own risk, and company will not be responsible for any claim

NEW YORK TELEPHONE AND TELEGRAPH CO

To.....DR.

Approved.

Sect. and Treas.

General Manager

YORK TELEPHONE AND TELEGRAPH CO., subject to the above notice
..... DOLLARS,
100

Payments

Date	Amount
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pay rolls on the above form, the form used should be longer, that any amount of names may
a voucher half the length of this one, and they are filed away with the blanket voucher.)

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TELEPHONE ACCOUNTING

By **GEORGE ARTHUR JACKSON**, of the Central New York Telegraph and Telephone Company

For forms illustrating this article, see supplement with this issue.

IN LAYING out a method of telephone accounting I have condensed the system as much as possible. The principal divisions of the work are as follows:

- I.—The General Ledger.
- II.—The Voucher System.
- III.—The Subscribers' Ledger.
- IV.—The Toll System.
- V.—Monthly Record of Business by Exchanges.

I.—THE GENERAL LEDGER.

The General Ledger shall consist of the following accounts:—Capital Stock, Increased Capital, Profit and Loss, Surplus, Bonds, Reserve Accounts:—Reserve for Unearned Rentals, Tickets, Maintenance, Reconstruction, Taxes, Accrued Interest, Legal Expenses:—Bills and Accounts Payable, Franchise, Construction Accounts:—Aerial Construction, Underground Conduits, Underground Cables, Construction Equipment, Toll Line Construction, Right of Way, Furniture, Supplies, Real Estate, Suspense, Accounts Receivable, Cash, Revenue Accounts:—Exchange Service, Telegraph Commissions, Toll Service, Private Line Earnings, Messenger Earnings, Real Estate Revenue, Conduit, Pole and Line Rental, Interest, Miscellaneous Revenue.

Expense Accounts, General:—Salaries and Wages, Rent, Light and Heat, Travelling, Postage, Printing and Stationery, Taxes, Legal Expenses, Incidentals.

Operating:—Salaries and Wages, Rent, Light and Heat, Incidentals.

Maintenance:—Salaries and Wages, Rent, Light and Heat, Material, Travelling, Conduit, Pole and Line Rental, Insurance, Damage and Compensation, Incidental, Reconstruction, Maintenance Reserve.

Other Expense Accounts:—Private Line Expense, Messenger Expense, Real Estate Expense, Miscellaneous Expense, Dividends.

I.—THE GENERAL LEDGER.

Explanation:—Surplus account is the final result of the year's business. All expense and earning accounts are closed into Profit and Loss Account, and the balance is transferred to Surplus. Unearned Rental Account will show no balance at this time, as the rentals are charged up quarterly as follows: January 1st, April 1st, July 1st, October 1st. The first month's rentals are credited to Exchange Service, the balance to Unearned Rentals. The remaining months of the quarter are credited separately to Exchange Service Account, and charged in the same way to Unearned Rentals.

An increased Capital Account is carried until Capital is entirely paid in, then transferred to Capital Stock.

Furniture Account is a subsidiary account—at the end of the year a certain per cent. is deducted for depreciation, plus the amount of furniture added during the year. This account should be transferred to Construction Equipment. The percentage of depreciation should be charged to Maintenance Material.

Suspense is a subsidiary account of Accounts Receivable, and should be transferred to that account. It is made up of all the uncollectable accounts of the Company, which should be charged off at a certain time each year.

Reserve Accounts:—A certain fixed amount should be laid aside each year in keeping up the plant and meeting certain expenses. The balance of the amount should be put into Reserve Accounts. One-twelfth of the amount is charged monthly if the expenses exceed the amount charged; the difference is charged into Reserve. If the amount which is carried into Reserve is too large to charge off at the end of the year, it should be carried into the ensuing year, and a certain portion charged in if possible. If the amount is a credit to Reserve, it should be carried over into next year and the fixed amount charged.

Construction Accounts:—These accounts are kept entirely separate from all Expense Accounts, and are kept by themselves. An account, Right of Way, should be kept so as to see what the Company is paying for extending its lines. This account is a subsidiary account of Toll Line Construction.

In closing book for the year, the General Accounts should be closed into Expense Incidental, Operating into Operating Incidental and Maintenance into Maintenance Incidental.

II.—THE VOUCHER SYSTEM. (See Forms 1 and 9 in Supplement.)

All expenditures of the Company should be protected by vouchers. The vouchers shall be of such form and size as to get all necessary detail entered on them. A voucher book (Form 1) should be kept in which to enter all vouchers. The total amount charged to each account on voucher book should be posted to its corresponding account in the ledger.

In enclosing invoices or vouchers in a blanket voucher, due care should be taken to number every one, so that when the blanket voucher is returned, the contents can be checked with the entries thereon, and then if one is missing it can be traced. The numbers on the list should be left blank until every voucher is returned and complete.

A special column should be opened on cash book for bills payable, and all vouchers paid, with the exception of accounts which are on the ledger, should go through this column. Ledger accounts are opened only with Firms with which the Company does most of its business. The number of each voucher should be entered also on the cash book.

III.—THE SUBSCRIBERS' LEDGER. (See Form 2 in Supplement.)

The form accompanying this article should readily explain the system. Any number of accounts may be opened—there are twenty-five accounts on a page; the total amounts at the bottom of each page are drawn off to get a balance.

IV.—THE TOLL SYSTEM. See Forms 4, 5, 6, 7 and 8 in Supplement.)

A toll report from (Form 6) should be used that will be simple and adequate for all the agents of the Company.

A toll cash book should be opened for the tolls (Form 8) which should be entered from the toll reports after they have been compared and marked correct. When toll reports are received, the form in which the cash is received should be entered on the report, also on a small book. The cash on this book should balance with the cash entered on the toll cash book, at the end of each month. The name of the station remitting should also be entered.

The toll reports should be compared,—messages sent by one station should agree with the number received by the other station. If the receiving station reports more than the sending station, an error card (Form 7) should be sent for the difference.

Agents are required to keep records of the sender and receiver of each message (Forms 4 and 5), or a book with "In" messages and one with "Out" messages. He should keep the originals and return the duplicates to the General Office. An error card book should be kept and an account with each station opened when the cards are sent out and the station in error should be charged. When the cards are returned, the cash is entered on cash book, and station is given credit on error card book also.

A toll station account (Form 8) is opened with every exchange, and the tolls are charged from the reports. When the reports are sent in there is no cash included, the money being deposited in a local bank. Credit is given as the tolls are deposited.

V.—MONTHLY RECORD OF BUSINESS BY EXCHANGES. (See Form 3 in Supplement.)

The territory of the Company should be divided into exchange districts, and the earnings of toll stations tributary to a certain exchange should be credited to that exchange. The subscribers' rentals will be one-third the amount charged at beginning of each quarter, plus all earnings for exchange service; and deducting all rebates for the month's business.

Expenses:—The amounts charged to exchanges on the voucher book must be taken first, then every charge and credit to each account, that can be classified to any one exchange. The general charges and credits should be worked separately and then added to the proper exchanges. The percentage that each exchange should bear of the general expense is apportioned on the basis of gross revenue.

After making up the general expenses, the Operating and Maintenance should be followed in the same way. Adding the totals and deducting the amount from the gross revenue gives the net revenue of each exchange. The point in keeping this book is to show in just what exchanges the Company is making or losing money.

FOREIGN CURRENTS

Wireless telephony is again much to the fore in the daily papers. The English papers are full of the flowery statements of a company which has been organized, with a "nominal" capital of \$875,000, to operate the Armstrong-Orling system of wireless telegraphy and telephony. It is said that operations on a large scale will be begun very soon. One of the London dailies says that a perusal of an advance proof of the catalogue suggests the possibility that every one will be enabled within six months to buy for a moderate price a handy wireless telegraph and telephone apparatus for private installation and use. It will be the simplest matter to connect all the rooms in a house, or to connect a house with the city. Patents have been taken out by the Armstrong-Orling people, whose system differs in many important respects from that of Signor Marconi.

* * *

Marconi will have to look to his laurels, and telephone men will have to stop to consider whether it is worth while to continue to invest good money in cables and pole lines, if there is anything in the "possibility" suggested by a perusal of the advance proof of the Armstrong-Orling catalogue. It is well to let the worst be known at once. The Armstrong-Orling syndicate claim that they can now telegraph or telephone fully five miles, and by the time the company is in working order they expect to be prepared to sell an apparatus with which every one will be able to telegraph or telephone anywhere within at least twenty miles. The ground is always used as a conductor. All that is needed is to connect the telephone in a room with the transmitter or receiver by means of a short wire with the nearest gas or water pipe, which will carry the current to and from the earth. The walls of houses do not form any obstacle.

When telegraphing at a greater distance than twenty miles the Armstrong-Orling Company is still forced to use the air as a conductor of the shooting electrical sparks from station to station. This requires high poles at both ends, but they say that these poles will be only one-tenth the height of those used by Signor Marconi in order to be effective for the same distance. They also say that they are able to send 100 letters in the same time that it takes Marconi to send six.

* * *

It is encouraging to learn that the system, besides being wonderfully effective, sensitive almost beyond belief, is also to be very cheap. The relay devised by the genius of Armstrong and Orling, which is described as being "an appliance used for catching or receiving the electrical impulse shot through the air from station to station," is far more sensitive than any ever previously invented, and is fifty times more sensitive than Thompson's syphon recorder. It is so sensitive that a dry battery, consisting of a piece of zinc of microscopic size and an infinitesimal piece of carbon, will work it. In a test with Marconi's Siemens "relay," the latter, with eight volts, recorded electrical impulses at 1,699 miles. The Armstrong-Orling people say that their "relay," with only one volt, worked even at 1,299 miles.

According to advance proofs of the price list, the charge for transmitters for sending Morse signals short distances will be \$50, and for long distances \$75, in addition to royalty of \$5 per year. A complete telephone outfit for short distances will cost \$20 per year and a royalty of \$5. The prices of the relays are left blank for the present, but will be filled up later on.

* * *

Regarding the announcement that the Armstrong-Orling people are preparing to put on the market a practical system of wireless telegraphy and telephony, *The Sun* (N. Y.) has this to say:

"This development, it is said, is the outcome of experiments made at Hughenden in the autumn of 1901, when electrical impulses were sent through the ground without wires and without the high poles used by Marconi. Among the experiments was one on the steering gear of a torpedo lying at a distance of 500 yards in a ditch filled with water. The torpedo was moved at will to the right or left by pressing or releasing the lever of a small transmitter into which the electrical current of a small battery had been conducted. In a similar manner an electric lamp raised on a high pole far out in the fields was lighted and extinguished.

"In all cases the electric current was generated by an ordinary Bunsen carbon and zinc battery, and then led into the ground through a transmitter, which was kept in a case no larger than

a good-sized cigar box. Thence the impulses speedily traveled to their destination, where the receiver was waiting. In both the transmitter and receiver are imbedded the secrets of Armstrong's and Orling's invention. Last autumn one or two miles seemed to be the limits of telegraphing or telephoning through the ground. Since then Armstrong and Orling, with eleven Swedish assistants, have enormously increased the power of the transmitter and the sensitiveness of the receiver."

* * *

At the time of the experiments referred to by *The Sun* there was a certain amount of excitement in the English daily papers, which was doubtless the object of those experiments. The technical press left the matter severely alone. Wonderful claims, even when accompanied by a few experiments, that are based on secret relays and receivers and transmitters are more easily swallowed by lay editors than by those of the technical journals. Neither Armstrong nor Orling is known in England as an electrical engineer or scientific electrician, and the syndicate showed no desire at all to explain the working of their wonderful inventions to the representatives of the electrical papers. Consequently the electrical papers are quite justified in showing no faith at all in the claims of the Armstrong-Orling people. The thing may be a pure fake, or it may have enough in it to form the basis of a stock jobbing scheme, but that the claims made for a general wireless telephone system have any serious foundation no telephone man can be expected to believe. Until very convincing evidence is presented that the work of the Armstrong-Orling syndicate rests on a really scientific basis the prices of wire and cables may be expected to hold their own.

* * *

A recent dispatch from Berlin, which got a scare "wireless telephone" heading in the daily papers, says that Ernest Ruhmer, a distinguished scientist, whose fame had hitherto not crossed the Atlantic, had succeeded in telephoning a distance of seven kilometers—a little over four miles—without employing wires. Throughout the experiments the transmission of the voice was very good. The method employed by Herr Ruhmer is that which has been used in various experiments in this country. Professor Bell first showed that speech could be transmitted along a ray of light, and called the apparatus the radiophone. In 1898 a radiophone was shown in operation in New York at the Electrical Exhibition. An electric projector was used with a telephone transmitter in parallel with the arc; the voice currents caused variations in the arc, which were transmitted by the beam to the receiver. Herr Ruhmer seems to be working along the same lines, as it is said that he has been working up to now with a projector of about 14 inches diameter of lens and reflector. He intends to build one of forty or even eighty inches, with which he hopes to be able to telephone a distance of forty kilometers—say twenty-five miles—along the beam of light. Herr Ruhmer, not being a company promoter, admits that the apparatus is too bulky, too delicate and too expensive for it ever to be of practical commercial utility, but he thinks the method will be most useful for warships for communicating with each other when at sea.

* * *

An interesting legal decision regarding telephone work was recently given by the judge of an English county court. The point sought to be decided was, what was "a reasonable time" for building a private wire between a subscriber's residence and his place of business. The judge did not give a definition of what was, but he was emphatic in describing sixteen months as anything but a reasonable time. It appears that the company took this time to provide the connection, and that then the subscriber refused to allow the instruments to be put in. The company felt that it must put in something, so it put in a claim for eighteen dollars, and it didn't take sixteen months to do that, either. But the agreement on which the claim was based proved a two-edged weapon; it stipulated that the work was to have been done in a "reasonable time," and the judge dismissed the case, refusing the company so much as the luxury of leave to appeal. Telephone subscribers, although they often take a long time to make up their minds to become such, are notoriously impatient to have a connection completed when once it has been ordered, but one can hardly blame any one for refusing a connection proffered sixteen months after the order was given.

The Arrestor.

IN THE OPERATING FIELD

SIMULTANEOUS TELEGRAPHY AND TELEPHONY

A CORRESPONDENT writes as follows, asking for a description of simultaneous telegraphy and telephony:

HOMER, Mich., July 29, 1902.

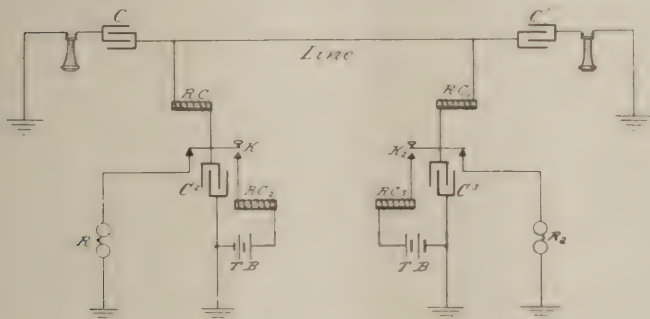
Editor THE AMERICAN TELEPHONE JOURNAL:

DEAR SIR:—We have a metallic toll line fourteen miles long, and would like to use it for both a telegraph and telephone line. Will you please publish a diagram in the JOURNAL showing how this could be done.

Yours truly,

B. F. WOODBURY.

It is by no means unusual practice to use telephone lines for telegraphing also, by means of a phantom circuit obtained by the use of the Van Rysselberghe system or some modification of it. The late T. F. Van Rysselberghe, who was chief engineer of the Belgian State Telegraphs, in experimenting to arrive at a means of reducing the interference between telegraph lines and neighboring telephone wires, discovered that by the use of condensers and retardation coils on the telegraph lines the telegraph signals were so flattened out, rising so slowly from zero to maximum strength and falling so slowly from maximum strength to zero—slowly, that is, in comparison with the rapid alternations of telephone currents—that the inductive disturbances on the telephone lines were done away with. The success of these experiments led Mr. Van Rysselberghe to try the effect of telegraphing and telephoning on a single line equipped with retardation coils and condensers, and he demonstrated that this was quite practicable.



The arrangement of the apparatus is shown in the diagram. Beyond the connection of the telegraph instrument circuit to the line is placed a condenser of about one-half microfarad and to the opposite side of the condenser the telephone station is connected. The diagram shows a grounded circuit; with a metallic circuit a condenser should be connected on each side of the telephone station, the wires of the telegraph circuits, which are shown grounded, being connected to the second line wire. A retardation coil of about five hundred ohms resistance is inserted at each telegraph station, between the line and the pivot terminal of the key, and a retardation coil, which may be of lower resistance than the first, is inserted between the battery and the front contact of the key. Between the pivot terminal of the key and the ground or return wire is interpolated a second condenser of one-half microfarad.

A metallic circuit telephone line may be used for two grounded circuit telegraph lines by this method, giving three separate circuits, two telegraph and one telephone. The only variation from the diagram for this arrangement is to put a condenser between each line wire and the telephone station at each end—making four condensers in all—and leg off the telegraph circuits as shown, two on each line wire.

The Van Rysselberghe system is used on circuits of considerable length, but it is not adapted for very long telegraph circuits, nor for high-speed telegraphy, on account of the slowing-up of the telegraph signals. In telephone work, however, it can often be used to great advantage in telegraphing orders, service instructions and so on, while the circuits are earning telephone tolls.

SUGGESTIONS FOR BUSINESS BUILDERS

THE Keystone Telephone Company of Philadelphia has inaugurated some novel methods to get subscribers. In its official directory is the following notice:

"Parties wanting to be called during the night or at certain times in the morning will be accommodated if instructions shall be left with the chief operator."

The Keystone people also give information on the following matters: Time of day, arrival and departure of trains and election returns. They are now putting in fire alarm relays in their offices, so as to tell the location of fires.

* * *

The Lafayette Telephone Company of Lafayette, Ind., has recently established an "Information Desk." By calling this desk, subscribers can get accurate information on these subjects: Arrival and departure of trains, weather indications, according to the Weather Bureau, correct time of day, baseball and other sporting news, election returns, theatre attractions, location of fires, and, when in a hurry, the "Information Desk" will tell a subscriber any telephone number in the directory, saving him the trouble of looking it up.

* * *

The Bell Company, operating in Washington, Ind., has placed extremely sensitive transmitters in all the churches in the town, and gratuitously connects its subscribers to the "church line." Small watch receivers are provided patrons, and the entire church service may be heard, while the subscriber sits in his easy chair at home or lies in bed.

* * *

President S. P. Sheerin, of the New Telephone Company of Indianapolis, says his company, in the near future, will probably give a "church service" similar to that in Washington.

* * *

THE AMERICAN TELEPHONE JOURNAL, in a recent issue, gave a suggestion for telephones in restaurants. Several Independent companies have taken up this scheme, and it has met with much success.

The Bell Company of Denver, Colo., will establish a service of this sort. While eating dinner a person is enabled to call up any one with whom he may wish to talk.

* * *

The Maryland Telephone Company, an Independent concern operating in Baltimore and vicinity, is installing a system of automatic fire alarms in connection with its telephone business. A subscriber, with one of these instruments in his home or office, knows that he has a very efficient fire watchman, for when the temperature rises above a certain point an alarm is turned into central, and the operator there immediately telephones fire department headquarters.

A NEW SELECTIVE RINGING DEVICE

A novel selective ringing device for party line telephones has been invented and will probably be put on the market soon. It is said that the principle on which it works is entirely new, the Patent Office having allowed fifteen of the original claims. With this system in use only one party on a line may be rung, and every other subscriber is locked out. The party line is cut into separate parts, each line connecting two telephones. When a certain call is made, the machine connects and rings only the subscriber desired, cutting out all the others. It is alleged that the device, which is contained in a small box, can be applied to any telephone or party line already in use.

Two Wheeling electricians, Frank Hall, of the Mountain State Electric Company, and A. F. Poole, of the Poole Clock Company, are the inventors. They have been working on the device for about a year and now have a working exhibit on which are twenty telephones. It is alleged that the system works perfectly on this experimental line, and Independent telephone men are interested in securing the right to use the system.

Opinion and Comment

THE PUBLIC AS AN OPERATOR

IN his article on "Long Distance Telephony," published in a recent number of *THE AMERICAN TELEPHONE JOURNAL*, Mr. Joseph B. Baker put his finger on one of the weakest spots in the telephone industry—the inaptness of the general public in handling the telephone. Mr. Baker confined himself to long distance work, and chose his illustrations entirely from long distance connections, but the same general trouble obtains to a greater or less extent in the local telephone service everywhere. The lack of smartness in operating the public end of the telephone system renders the service given by that system far less efficient than it might be were there a thorough and intelligent co-operation on the part of the public with the efforts of the telephone company.

Among its many peculiarities the telephone service enjoys the unique distinction of being the only public service in which the machinery is actually under the control of the public and is handled by the public. True, the public does turn on and off its own gas, water and electric light, and occasionally lack of efficiency, or plain carelessness or ignorance, result in explosions, asphyxiations and other troubles even from those very simple operations. But in the working of the telephone service, to attain the efficiency that is generally aimed at, something more is demanded of the public than a simple mechanical operation, such as turning a key or pressing a button. That something more is certainly not very complicated or very extensive, but it requires a certain conscientiousness, a recognition of what is due to one's neighbor and a spirit of co-operation that are too often wholly absent from the public operation of the telephone.

Since the telephone operator first appeared in the land she has been the butt for the gibes and jeers of the flippant newspaper writer. The changes have been rung on every one of her little lapses and on all of the natural difficulties with which any telephone system has to contend. But what newspaper writer stops to consider that in any telephone connection there must be co-operation between at least three persons, the calling subscriber, the exchange operator and the called subscriber, and that consequently the subscriber—the public—are responsible for two-thirds of the operating and the telephone operator for only one-third? The exchange operator does certain mechanical things on the instructions of the public. If those instructions are not correctly and succinctly given, errors and delays arise; if the called subscriber does not respond promptly to the operator's ring, all she can do is to continue ringing—she cannot get him to the telephone by force or by hypnotic suggestion. If the caller leaves his telephone before the connection is established, he has to be rung up and brought back.

Yet, although it is clear that the efficiency of the telephone service lies at least as largely in the hands of the users of it as in the hands of the telephone company, how many telephone users do we not all know, who habitually practice all the telephonic sins of commission and omission? "Wrong numbers" are often due to the subscriber who trusts his memory too well. "Cut-offs" are often due to the subscriber hanging-up or signaling when he should simply hold on. Delays in completing a connection are generally due to the failure of a called subscriber to answer the telephone promptly and to the practice of making a call and then hanging up, which requires the operator to ring the caller back to the telephone. Then there is the office boy, who is undoubtedly one of the most active curses of the telephone service. Both as a caller and as an answerer he is lax, inefficient, unintelligent and usually impudent into the bargain. The habit of deputing

an office boy to call some one up on the telephone and to get the person wanted on the line before the real caller goes to his telephone, is a most pernicious one, but it is difficult to get those who indulge in it to realize that it involves both a wasteful use of the telephone plant and a gratuitous impertinence to the person that is called. There are few telephone experiences more aggravating than to be called to the telephone and be asked by a boy if you are Mr. So-and-So and then be told to wait a minute, that Mr. Blank wants to speak to you.

The aggregate effect on the efficiency of the telephone service of the lack of intelligence, of quickness and of consideration in the public operation of the telephone is great and far-reaching. Every error and every delay increase the amount of time that the telephone plant is used unprofitably, and while the plant is working uselessly to get a wrong number or waiting to get some laggard or indifferent subscriber to the telephone, the way is blocked to other calls. Since telephone calls occur by the tens and hundreds of thousands daily, the aggregate amount of time that is wasted by needlessly slow operation by the public, reaches startling figures. Telephone managers should do everything in their power to train their subscribers as well as their operators. This is a point that is very generally neglected, but if telephone subscribers as a body could be impressed with the importance of scrupulous accuracy in giving numbers, of always answering the telephone as promptly as possible, of always remaining at the telephone until the called station answers, and of always making calls in person and never by deputy, there would be a general and very marked improvement in the efficiency of the telephone service.

STANDARDIZATION

IN a recent paper by Mr. L. W. Stanton, of *THE AMERICAN TELEPHONE JOURNAL*'s staff of contributors, it was pointed out that the telephone company giving the best service for the lowest price is the one that will survive. This is a most important factor in Independent telephony, and its value to operators cannot be emphasized too frequently.

Mr. Stanton, who is superintendent of equipment for the Federal Telephone Company, of Cleveland, has had to meet the question in practical life, and his conclusions have the force that comes of this condition. He enumerated three serious problems that Independent telephone men have to struggle with—tariff, traffic and equipment. It is hard to say which is the most important of the three. They are all intimately related and each has a bearing on the other. Many telephone men profess to think that there is no relation between tariff and traffic, but in this they are greatly mistaken. The cost of the service is largely dependent on the volume of traffic and the manner in which it is handled. As to success with the public, that is entirely dependent on the manner in which the traffic is handled, and Independent men who neglect to study their traffic closely and continually are neglecting the most important part of their business.

The question of standardization of equipment is one of much difficulty, but of the greatest moment to the business as a whole. With many different manufacturers supplying many different types of apparatus there is a chance that much trouble and confusion will arise as the systems of different companies extend and come into contact. It is a little early in the history of Independent telephony for much real inconvenience to have been felt on this score yet, but it is a question that will have to be faced before long, and since forewarned is forearmed both manufacturers and operators should be grateful to Mr. Stanton for his note of warning.

Fortunately, the manufacturers in the Independent field are competent, wide-awake men, and they have in a good measure anticipated the conditions that must ensue. They have already worked toward a standardization in equipment, and as a result there are to-day quite a number of systems in existence where apparatus made by different houses is worked satisfactorily in one service.

CONTEMPORARY CROSS-TALK

IN the last installment of our argument on city telephone rates we reached the conclusion that it is practically impossible to graduate the charges for local telephone messages strictly in accordance with their real cost. Although we know that the cost of the message depends on the number of minute-miles which it contains, general conditions, while sanctioning a recognition of the minutes, practically preclude us from taking account of the miles and charging accordingly. We mentioned the method in vogue in London and Berlin of dividing the area into districts, so as to obtain a higher rate for the message that involves the use of very long lines, and the peculiar formation of the legal city of New York, that makes toll charges between the different boroughs of New York seem entirely reasonable. But London, Berlin and New York are exceptional cities, and it will be many, many years before any but a very few cities approach the present conditions of London, Berlin and New York in population and area.

* * *

There is one other method of giving recognition to the cost of the distance element in the local telephone service and of obtaining higher rates for the longer distances, and that is to make a low rate for service local to the exchange to which the subscriber is connected and a higher rate for service covering connection with other exchanges. This is a part of the general practice in European telephone rates, and while it makes evident the fact that the cost of the service is dependent on the distance to which messages are carried, and is an entirely logical method of charging for telephone service, it is a system that has various disadvantages and is not easily applicable to the changing conditions of telephony. For one thing, it is not easily applicable to message rates, especially with automatic meters. Then, as the great growth of city telephone systems necessitates the constant division of the city telephone areas into smaller and smaller exchange districts, the proportion of messages local to each exchange becomes gradually smaller and will eventually be almost insignificant; so that considering that charges which should differentiate between a message local to the exchange in which it originated and a message directed to any other exchange would give only one step or graduation in the charge, that the lower charge would apply to but a small proportion of the messages (and that a constantly diminishing proportion), and that such a method would involve much complication in metering and accounting, on the whole there is not much advantage in adopting this plan of recognizing the effect on cost of the distance element. Further, as public opinion must always be taken into account in the consideration of telephone charges, it must be borne in mind that under this system the larger proportion of messages would pay the higher rate, which is the reverse of what happens with most public services, where the extra or higher rate is the exception; therefore such a method of charging would be unpopular with the public and would give rise to more harsh criticism and invidious comment than a flat charge for all messages.

* * *

It looks, therefore, as if we would have much difficulty in hitting upon a satisfactory, logical, workable and popular method of graduating charges for local telephone service in accordance with the distance to which the messages are carried, which we have satisfied ourselves is one of the governing factors in the cost of handling the traffic. Where then, are we to look for compensation for the gradually increasing cost to us of handling the message, which, if all other conditions remain the same, will surely accompany the gradually increasing number of minute-miles that the average telephone message will consume as time goes on and the use of the telephone service develops? That is a pretty serious question, a very broad and complicated question, and one, since it goes to the very kernel of the cost of furnishing telephone service, and, consequently, contains the secret of making a safe profit and avoiding a sure loss, to which it is essential to find a correct answer.

* * *

In a business which is made up of so many and such varied details, in which the general conditions are so constantly changing, in which there are so many factors to be considered, it is

impossible to put the answer to such a searching and important question in a few plain and simple terms. The proposition, briefly, is this: The cost of furnishing a telephone message depends on the number of minute-miles consumed by the message. You can take care of the minutes, but in the local service the number of miles in the average message will gradually and steadily increase, and it seems impracticable, all things considered, systematically to graduate your charges for local messages in accordance with the distance each message has to be carried. How, then, having fixed a price for the local message, are we going to cope with its gradually increasing cost and prevent that increasing cost from swamping our profit?

* * *

It seems that the solution of the difficulty will come both from within and from without. Abandoning, for the present at any rate, the idea of graduated charges for local messages based on any of the methods that have been discussed, *i. e.*, charging in strict proportion to the distance, or by a zone system, or by rates differing according to whether the service is to be local to one exchange or to be general over the whole system, we will consider that we are bound to make a uniform charge for the message and let the distance element take care of itself, or rather we must endeavor to take care of it and prevent it from running up the cost per message to the point where that cost will overtake the price at which we are selling the message. The first method of attaining that end, which obviously suggests itself, is to reduce our line costs. If the amount of line used for each message is going to increase steadily as time goes on, and so increase the cost of carrying the message, the obvious corrective, the most obvious means of maintaining a balance, is to effect economies in the cost of building and maintaining lines, and so be able to use a constantly increasing amount of line per message at a constantly decreasing cost per unit of line.

* * *

That line costs are a governing factor in determining the price of telephone service is a fact on which there is plenty of evidence to be found on all sides. In long-distance work the line costs are obviously the governing factor. Advocates of cheap postage have frequently pointed out that the cost of carrying a letter between two centres varies very little with the distance between the two points, and is but a small proportion of the total cost of handling the letter. The chief element of cost in working the mails is the labor of collection and distribution, so that a letter going from New York to Chicago or to San Francisco costs but a trifle more to handle than a letter going from one part of New York to another, or a letter local to Chicago or to San Francisco. With telegraph and telephone messages the case is entirely different. The cost of handling the telegraph message depends very largely on the distance to which it is carried, and after a certain point the distance becomes the governing factor. This is very clearly shown in the case of submarine lines, where the line costs are very heavy and wholly overbalance the costs of transmission and distribution.

* * *

The telephone message is unique and distinct from all other communications in the method of handling and in the demands it makes on the machinery by which it is handled. Letters are transported in bulk, by the ton, but they must be distributed as units, and are practically collected as units. Telegrams are to a certain extent transmitted in bulk by modern methods of machine transmission, and to a certain extent at the convenience of the telegraph company. The sender of a telegram does not stand over the operator and insist on seeing his message transmitted immediately. But the telephone message is an individual transaction, and as such makes a peculiar demand on the machinery of transmission. For one thing, it demands the line entirely to itself and declines to occupy it in company with one or several other messages, as with duplex and multiplex telegraphy, much less with hundreds or thousands, as with a letter in the mail bags. For another thing, the telephone message, being the word of mouth of an active and generally impatient human being, wants to be given course immediately. "The telephone is instantaneous," say the telephone men, and every telephone user at least wants it to be instantaneous, and, whenever he finds that it is not, impresses his

wishes on the operator with emphasis that grows with each reiteration.

* * *

Then, not only does each telephone message consist of an individual operation, demanding individual use of the machinery of transmission—of which the line is the principal part—and demanding it immediately, at the convenience of the sender and not at the convenience of the agent, but it involves an amount of unprofitable use of the machinery of transmission, which is a further point of difference between telephone messages and letters or telegrams. In handling a letter, unless it be defectively addressed, there is practically no extra or unprofitable work to be done, no service instructions to give or special arrangements to be made. With telegrams the extra or unprofitable work is also very slight, and, as with letters, assumes serious proportions only in the case of defective addresses or errors due either to bad writing or mistakes in transmission. The service instructions of

a telegram are usually confined to the number, date and time, with occasionally some special signal or designation, and occupy the line to a very small extent for each message. With the telephone message the case is entirely different. The time spent in calling, in building up the line, in transmitting the service instructions, in getting the distant party to the telephone, in starting the conversation, in checking, and in clearing the line after the message has been transmitted, is, as every telephone man of experience knows, a large proportion of the total time occupied by each message. It is time used unprofitably, for which the telephone company apparently gets no pay, although the price of the message must, of course, include the cost of it, and it is time, as Mr. Baker pointed out the other day, that is often needlessly extended by the torpidity and lack of intelligent co-operation of the telephone user.

The Listening-Key.

WHERE THE SWEDE LINEMAN GOT INTO TROUBLE

A Dialect Contribution by E. H. MARTIN, President of the E. H. Martin Telephone Company, Webster City, Iowa

HAY bane fer hal hot vetter fer faller lake mae to yump around all tame "shooting" trouble fer boss faller who yump on mae ef A enta hurley up, un a tank hae mek mae sick un a wanto yump mae yob.

A now writngs to you to see ef you en con usen en hal good lickerishtrician to work en trouble colum of your wealthy yournal.

Mae name is Chris Lindholm un A har bane on des country one yare fampteen months un sax week, A con spoke tra language, "Chicago, Minnepaul un Saint Apolis."

A bane travel all roun world un a finaly stop po Paulsota where A get good yob fer talafone faller, hems pay mae fampteen dollar month un A eats mae-self, un hae sleeps mae.

First day A har bane vorkin here hems faller sent mae down po shop to bring hem basket full of amperes, hae say he vant to usen em to re-wind some suction coils. A look aroun fer half anour un A enta con fin em so a tek some glass bottles det enta hav bottom on.

When a boss faller saw det he mek mae yump may yob right away un A enta givdam too. A enta liken et har anyhow, gess dets him.

A tank A skall go po Chicago so A go po ticket agent faller un a say to hem "How much you cost mae fer ticket po Chicago" un hae say "How you vant go on Railway cars oder steamboat cars" un A say "A enta care yusta which way is a cheaper" un hae says "Steamboat cars is a cheaper" un A say "All right A vill tek ticket" un A yump on a boat un a goo down raver a couple of days.

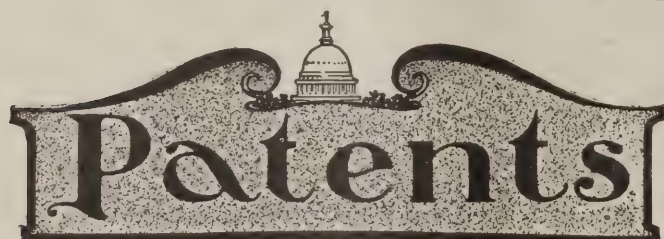
When A gets po Chicago A goes po Post Auger Master un A says to hem "Har you got any mail fer mae" un he says "What is your name" un A says "You dem fool ef you look on de latter you vill easy find mae name."

A got latter all right nuff from mae broder Ole un A read en all up an A go po hotel un writing answer an A go back po

postauger Master un A say to hem "How much you costem mae fer ticket fer letter po St. Apolis Paulsota" un hae says "Two cent" un A says dets funny tang, when A am in St. Apolis det yuste cost mae one cent un dets all de money A vill pay un hae says he conenta help det unless hae pay one cent hems own pocket out un A gets pretty dem mad un A walk Away, but you bet mae life A get even vet det faller for A wait until hae enta vas looken un A drop et in vitout any on at all.

When A gets po Chicago A go po hotel un hae got clerk faller behind counter un A go right up to hem un A say "Do you keep stopers here" un hae say yes un A say all right A lek to stow har vat is your rates un hae say \$4.00 Vell, A tank \$4.00 week bane cheap nuff un A tol hem A vill stay whole veek un hae yump on bell un ring un litle faller come running up un clerk faller says "Show Mr. Larson to hes room" Hems litle faller show mae to room vat is about four feet square, enat got bed in, noting et all an A say to litle boy, "Ho de hal you spouse I'm going to sleep en des dem room" un litle boy hae enta sed a vord, yust pull a string un a dem room vent straight up in de air. Ven he got up four or fam blocks hae stop un litle boy show mae to room whats got bed in all right nuff un A stow har all night un next morning A go po clerk faller un A say to hem "A vant to see de dem town vat es a best vay" un hae say "ef you get on street car" so A yump on a street car un A bane riding along looken outen vindow when coal vagon got en vay un driver of street car stopen purty dem quick un A bump mae nose on glass vindow un det hurt mae un A say "Dem it" un faller yump up un shake fist under mae nose un he say "How dare you say Dem it before mae vife" un A say "How de hal you spouse A know your vife wanted to say dem it before A did" Vell, A stow po hotel whole veek un A go po clerk faller un han hem \$4.00 un tal hem dats fer mae weeks board un hems says "yumpin hal, dets \$4.00 per day" un A tal hem ef dets so A har to go back po work for noder sax months to pay hem up.

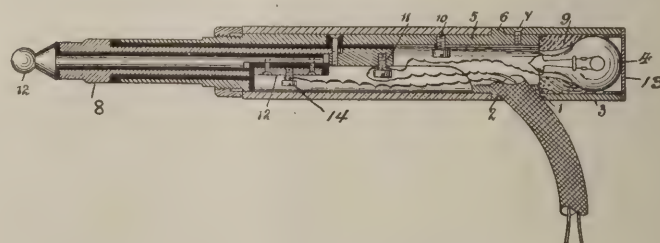
CHRIS LINDHOLM.



James B. Gill, of San Francisco, patents (Reissue No. 12,015, July 22, 1902) a toll-collecting and call-recording device for telephone systems, consisting of an automatic box of the usual coin-in-the-slot variety, with the addition of a device for recording the calls made at the station where it is used. The machine is extremely complicated, and a fair description of it could scarcely be made by abstract. The coin mechanism is adapted to but a single size of coin, so that the machine is intended for a nickel service. The call recording device consists of a revolving card, on which the record is made by means of a punch. This punch is controlled by a relay so arranged that the central office operator causes the record of the call to be made. The central office oper-

ator also controls the coin, and can either cause it to be returned to the user or to be deposited in the cash box.

Arthur T. M. Thomson, of East Dulwich, England, patents (No. 705,161, July 22, 1902) a connecting plug for electrical switchboards, in which the novelty is the insertion of the signal lamp in the end of the plug so that the plug becomes plug and



signal combined. The drawing shows clearly the arrangement of the device. In the socket 3 the lamp is held by the transparent screen 13 against the bush 9. The lamp wires are connected by screws 10 and 11 to the ring and sleeve of the plug, thus inserting the lamp in one of the cord conductors.



The Week's Messages.

New Companies

CORNING, ARK.—The Corning Telephone Company, of Corning, has filed articles of incorporation with the Secretary of State. It is capitalized at \$5,000, and proposes to put in a long and short distance telephone system in Corning and vicinity. The incorporators are W. O. Beard, W. H. Wilsey, S. A. Wilsey and Marie Beard.

GILLESPIE, ILL.—The Gillespie Telephone Company, of Gillespie, has been incorporated to operate a telephone system; capital stock, \$5,000. Incorporators: Jonah C. Steere, J. H. Rodiner and Henry R. Williams.

BRIDGETON, IND.—The Bridgeton, Mansfield and Diamond Co-operative Telephone Company has been incorporated, with a capital stock of \$1,000. Directors: Lee Mitchell, Oscar Cole and Ambrose Bramlet.

FOUNTAIN CITY, IND.—The matter of securing a telephone exchange in Fountain City has been settled. A few shares have been subscribed by outside parties. Outside capitalists have approached the promoters with numerous propositions for securing complete control of the system, but all such proffers have been turned down. The contract for installing the system is the next thing to be done.

PEKIN, IND.—The Indiana Telephone Company of Pekin, Washington County, has been incorporated, with \$560 capital stock. The directors are Charles L. Graves, Nora M. Graves and John T. Graves.

COON RAPIDS, IA.—The new telephone company held a meeting recently at which \$5,700 was subscribed in one evening. The articles of incorporation will be filed soon.

FOSTORIA, MICH.—The Chambers Telephone Company has been incorporated, with a capital of \$5,000.

MOUNTAIN LAKE, MINN.—The North Star Telephone Company has been incorporated, with a capital stock of \$50,000. Incorporators: Arthur D. Warner, St. Paul, and Jacob H. Dickson, Frank Balzer, Solomon Balzer and Jacob D. Schroeder, of Mountain Lake.

SKIDMORE, MO.—The Nodaway Valley Telephone Company, of Skidmore, has been incorporated, with a capital stock of \$3,000, all paid. Incorporators: Benjamin Bassett, W. B. Ward, G. W. Strickler, W. M. Howden, W. W. Grigsby, C. W. Brown and others.

BANCROFT, NEB.—Articles of incorporation of the Bancroft Independent Telephone Company have been filed. The incorporators are W. H. Watson, F. T. Rice, W. F. Sinclair and E. H. Morgan. The authorized capital stock is \$15,000, in shares of \$25 each. This is the second Independent telephone company to organize in this county.

HASTINGS, NEB.—The Adams County Telephone Company has been incorporated to operate a telephone service in this city and county. The incorporators are: Jacob Bernhardt, A. L. Clarke, John N. Lyman, W. H. Ferguson, W. H. Lanning, G. J. Evans, W. H. Waldron, C. W. Stewart. It is said that \$8,000 in shares have been subscribed and that as soon as shares to the amount of \$32,000 have been subscribed the company will proceed to put in a service.

ALAMOGORDO, N. M.—The telephone proposition here is resolving into a company and will incorporate with a capitalization of \$5,000 in 500 shares, and be called the Alamo Telephone Company. The directors are H. W. Schofield, O. C. Parson, J. R. Gilbert, A. J. Buck, Alfred Hunter and J. D. Bennett.

BUFFALO, N. Y.—The Grand Island Telephone Company has been incorporated, with a capital stock of \$10,000. The stock, consisting of 200 shares of the par value of \$50 each, is half preferred and half common. The company will construct a telephone line to connect Grand Island with the mainland. The incorporators and directors are Josiah Jewett, Jr., Buffalo; Frederick H. Williams, Buffalo; John P. Williams, Buffalo; John V. Bedell, Grand Island; Josiah P. Wright, Buffalo; J. Boardman Scovell, Buffalo, and Francis J. Airey, Buffalo. The company is incorporated for a term of sixty years. Application has already been made to the Town Board of Grand Island for a franchise allowing the company to do business.

LYNDONVILLE, N. Y.—The Orleans County Rural Telephone Company, with headquarters here, is making rapid progress in setting poles and stringing wires. The company has been regularly incorporated and the managers will make every effort to connect with Medina and Carlylon this summer.

CHESTERFIELD, S. C.—The Secretary of State has issued a commission

to John A. Welsh, Dr. D. T. Seal, J. P. Mangum, A. M. Moore, W. P. Swinnie and R. E. Rivers as incorporators of the Chesterfield Telephone Company, of Chesterfield, which proposes to erect and maintain a telephone line from Chesterfield to Cheraw. The capital stock is \$3,000.

EGAN, S. D.—Postmaster H. H. Maupin is displaying much enterprise by providing the town with a local telephone exchange, which he expects to have in operation soon.

HIGH, TEX.—The Farmers' Telephone Company, of High, Lamar County, has been incorporated, with a capital stock of \$7,000. Incorporators: M. D. High, Fred. Roach and D. W. Price.

Financial

DE KALB, ILL.—The DeKalb County Telephone Company, of DeKalb, has certified to an increase of capital stock from \$50,000 to \$100,000.

BOSTON, MASS.—The Hudson River Telephone Company has declared a quarterly 1½ per cent. dividend.

BOSTON, MASS.—The directors of the New England Telephone and Telegraph Company have declared a regular quarterly dividend of \$1.50 per share, payable Aug. 15 to stock of record July 31. Books will be closed from Aug. 1 to Aug. 14, both days inclusive.

MESABA, MINN.—The Mesaba Telephone Company has increased its capital stock from \$10,000 to \$35,000, and its debt limit in the same amount. The company is to operate a telephone system over the Mesaba iron range country.

GREENVILLE, MO.—The Greenville Telephone Company has filed an amendment to its charter increasing its capital stock from \$25,000 to \$35,000.

PENN YAN, N. Y.—The directors of the Keuka Park, Pulteney & Branchport Telephone Company have called in the balance of the payments on the stock, that the work on the line may be completed immediately, and it has also been voted that the price per share of the stock will be raised from \$30 to \$45. The new line of the Inter-Ocean Company is being rapidly pushed, and it is expected that it will be in operation in Penn Yan, and connected with all the Independent companies within a month.

AKRON, O.—The Akron People's Telephone Company has declared a quarterly dividend of one per cent. The company has been meeting with success and now has 3,200 telephones in use in this county.

Elections

BIRMINGHAM, ALA.—At the annual meeting of the stockholders of the People's Home Telephone Company a dividend of 2 per cent on the capital stock of the \$200,000 was declared. The following were elected as directors: H. H. Stambaugh, Youngstown, Ohio; A. F. Adams, Youngstown, O.; Jules Nautrot, Jr., Warren, O.; W. H. Hassinger, Birmingham; H. L. Badham, Birmingham; D. M. Foraker and Henry B. Gray. The officers are H. H. Stambaugh, president; Henry B. Gray, vice-president; W. H. Hassinger, secretary and A. F. Adams, treasurer. This is the first annual meeting of the stockholders and closes the first year's work of the company. A number of extensive improvements have been made in the system in that time, and it is now considered in first class order.

DAHLONEGA, GA.—At a meeting of the stockholders of the Dahlonega and Gainesville Telephone Company, the old officers and directors were re-elected. A dividend of 20 per cent was declared, being 60 per cent for three years. Some improvements were spoken of and will be made later on.

BOONE, IA.—The directors of the Pilot Mound and Farmers' Mutual Telephone Company have elected J. Maimquist, of Grant Township, as a director to fill a vacancy caused by the resignation of J. L. Good. Ten shares of the company have been placed at \$30 each, payable by Sept. 1. The directors are soliciting for bids and work on the new line will begin as soon as material can be obtained.

MT. PLEASANT, IOWA.—The new telephone company had an annual meeting of its stockholders. C. H. Brown, of Grinnell, was elected president; R. S. Galer, vice-president; H. G. Conger, secretary, and W. E. Keeler, treasurer. The new board of directors of five is composed of the following: C. H. Brown, W. J. Steckel, W. E. Keeler, R. S. Galer and H. G. Conger.

THE WEEK'S MESSAGES Continued.

RICHFIELD SPRINGS, N. Y.—At the annual meeting of the Richfield Telephone Company the following directors were elected for the ensuing year: F. C. Ward, A. A. Ward, Henry Davis, J. P. Arbuckle, M. A. McKee, John Gyer, Dr. W. P. Borland and F. E. Mungor. The directors chose the following officers: President, F. E. Mungor; vice-president, Dr. W. P. Borland; secretary, F. C. Ward; treasurer, John Gyer. It was voted to substitute cables for some of the overhead wires now in use. The company has nearly 100 telephones in use and new ones are being installed almost daily.

BERLIN, PA.—A meeting of the stockholders of the Union Telephone Company has been held and the following officers elected to serve for a period of one year: President, A. C. Floto; vice-president, C. H. Walker; treasurer, B. F. Hinemeyer; secretary, P. Reade Marshall; board of directors, J. G. Kimmel, E. F. Musser, Joseph Reitz, S. P. Brubaker, Chas. F. Cook, Dr. W. P. Shaw. Telephones, wires and other necessary supplies and appliances have been ordered. The wires will be strung and connections with town made in a very short time.

MANNINGTON, W. VA.—The Augusta Telephone Company, the charter of which was granted some time ago, has elected the following officers: Mayor I. N. Devore, president; E. C. Martin, vice-president; C. E. Jolliffe, treasurer; Caleb Burt, manager; F. R. Stewart, assistant manager, and R. W. Bryant, secretary.

Franchises

ALAMEDA, CAL.—The new Independent Telephone Company has applied for a franchise here. It is said that the company has plenty of money to carry on the work, and that it will furnish an improved service.

RIVERSIDE, CAL.—Pliny T. Evans has asked the City Council for a telephone franchise to construct and maintain for a period of fifty years an underground conduit system, and to erect and operate poles and wires, cables, etc., upon and over the public streets of the city. To do this the company will expend \$10,000 within eight months of the granting of the franchise; \$10,000 more within the next four months; \$10,000 more within the following six months; \$10,000 more within the next six months, and \$10,000 in the next twelve months, making an expense of \$50,000 to be laid out in the first three years after the granting of the franchise. Within thirty days of commencing the operation of the system the company will furnish the city with ten instruments free of charge during the term of the franchise. The rates for the first 2,000 telephones under this franchise shall not be over \$39 per annum for business and \$21 for private residences. The company will pay to the city two per cent. of the gross earnings after the first five years of its operation.

ST. AUGUSTINE, FLA.—J. W. Barwick, of Tampa, is in the city in the interest of a new telephone company, a charter for which is expected to be granted by the City Council.

AUGUSTA, GA.—An ordinance has been passed giving to the telephone companies the right to go underground with their wires. This privilege was sought in separate petitions both by the Bell Telephone and Telegraph Company and the Strowger Telephone Company. A price has been placed upon the franchise. The franchise right extends for a period of thirty years. There will be exemption for five years. For the next five years a franchise charge of \$100.00 per annum is exacted. After the lapse of ten years a franchise tax of \$250 per annum is provided for. Another stipulation is that, in accepting the franchise right, the companies agree not to increase the cost of telephones.

ROCKFORD, ILL.—The City Council has passed a resolution instructing the Corporation Counsel to prepare an ordinance cancelling the franchise of the Central Union Telephone Company in this city. The resolution recited that the company had violated its contract, and instead of reducing prices as had been promised, had raised them.

BEDFORD, IND.—Mr. Ruddick, of the Ruddick telephone system, has asked relief from the ordinance that limits the charge for his telephones to \$1.25 a month. He claims to be financially embarrassed and unable to complete the system, but with a franchise that will permit a higher rate it is claimed that backing can be had for the enterprise. A Louisville company has an option on the system and will take it if the proposed amended franchise passes the council. It is probably the Independent telephone company of Louisville that has an option on the system, and has connections through the Southern Indiana counties.

BURLINGTON, IOWA.—At a recent Council meeting an ordinance was adopted, granting the Modern Electric Company, of Burlington, Iowa, its successors and assigns, permission to construct, operate and maintain its lines of telephone and telegraph upon, along, over and under highways of the city of Burlington. The contract or ordinance will be submitted to a vote of the people. The company asks no exclusive franchise, no bonus, in fact, nothing but the privilege of connecting Burlington with hundreds of places which are not now on Burlington lines. It is the intention of the Modern Electric Company to connect with a large number of Independent mutual companies in Iowa and Illinois which are not at the present time connected with the city of Burlington. The contracts are ready to be signed up as soon as the franchise is granted. The following amendments to the articles of incorporation have been filed by the Modern Electric Company. The

amendments set forth that the authorized capital stock of the company shall be \$50,000, of which \$10,000 is fully paid. The second amendment is: "This company, in addition to its business of a general nature, as designated in Article 11, of its original articles of incorporation, shall have power to establish, construct, maintain, own, lease or otherwise acquire, telephone or telegraph lines and franchises therefor and sell, lease or operate the same and do and perform all business incidental thereto." Amendment 2 is: "The board of directors of this company shall consist of not less than three nor more than five stockholders." W. W. Copeland, president, and Geo. E. Wheeler, general manager, signed the articles.

HOPKINSVILLE, KY.—The Cumberland Telephone and Telegraph Company declined to bid on the renewal of its franchise in the city of Hopkinsville, which expires Aug. 9, on account of certain restrictions placed upon the franchise by the Council. The franchise was sold to J. E. Mott, of Huntington, Ind., for \$3. Mr. Mott says he will begin within thirty days the work of construction and will put in the Louisville Home system.

LEXINGTON, KY.—The directors of the Fayette Home Telephone Company have transferred the franchise of the company in Bourbon County to the Bourbon Home Telephone Company.

CUMBERLAND, MD.—The County Commissioners have granted the Western Maryland Telephone Company a franchise to place and erect its poles, wires and cables along the public roads, from the corporate limits to Cumberland westerly along the road to Mt. Savage and Ellerslie and from Mt. Savage to Frostburg, and from Frostburg toward Grantsville and Lonaconing and from thence to Westernport and from Cumberland on the National Pike to Frostburg and from Clarysville to Vale Summit, and from Cumberland to Cresaptown, Pinto and Rawlings, and from Cumberland to Flintstone and Oldtown, and in such other roads as may be necessary in carrying out a complete service to the people of the county. The telephone company is confined to various restrictions in the erection of said poles. The franchise is good for 25 years and the county is to be allowed in some instances free telephone service for the privileges granted.

SALISBURY, MD.—The Synepuxent Telephone Company of Berlin, Md., has applied to the County Commissioners for a franchise to erect telephone lines throughout the county. The Commissioners have held the matter under consideration until a delegation of the stockholders can appear before them and state more fully their object in securing a franchise and what inducements they can offer in the way of service and low rates. The Synepuxent Company is located in Berlin with Mr. Oliver D. Collins as president and Mr. L. L. Dirickson, Jr., as treasurer and general manager. If granted a franchise the company will run an Independent line from Berlin to Salisbury.

COLUMBUS, NEB.—Messrs. Cottingham and Everett, promoters of the projected Independent telephone system for Columbus, have been granted a franchise by the City Council, and they will proceed to push the work provided enough subscribers can be secured.

PERTH AMBOY, N. J.—Application has been made to the Perth Amboy City Council by the Hudson and Middlesex Telephone Company for a franchise through the city. In its application the company announces its intention of connecting Perth Amboy and South Amboy by means of the proposed bridge across the Raritan River. The company is now in operation in Woodbridge and other towns in the eastern part of the county.

BOLIVAR, N. Y.—A franchise has been granted to the Friendship Telephone Company to enter Bolivar.

MILWAUKEE, WIS.—Application for a franchise has been made by E. A. Wadhaus, as vice-president of the Milwaukee Independent Telephone Company, a corporation recently organized under the laws of the State of Wisconsin. The company requests permission to use the streets and public highways in this city, subject to such regulations as may be just and reasonable.

Underground

COHOES, N. Y.—The Cohoes and Waterford Home Telephone Company has asked permission to lay underground wires. It will be allowed to do this, provided it pays the expense of relaying the pavement.

Competition

SHELTON, NEB.—The Farmers' Home Telephone Company of Shelton has completed its line to Gibbon and is now operating with a list of ninety new subscribers. Since the completion of this line the Nebraska Telephone Company has reduced its rates between these two points from 25 cents to 15 cents for three minutes' talk, while the Farmers' Telephone Company is only 10 cents and time not limited. Arrangements are now being made to connect the new company's lines with the exchange of the Independent Telephone Company, of Kearney.

Combinations

GOSHEN, IND.—I. W. Smith, H. L. Oldfather and others interested are here arranging to consolidate the Farmers' Mutual telephone lines of Elkhart, Lagrange and Kosciusko counties, with an exchange in Goshen.

EMPORIA, KAN.—A transfer of the biggest part of the stock of the Emporia Telephone Company has been made and new directors elected. Wm. Reese, of Oklahoma City; J. H. Reese, of Lincoln, and C. E. Cheno-

THE WEEK'S MESSAGES *Continued*

worth, of McCracken, have sold out their entire interest. The new directors are Frank L. Brown, clerk of the United States Court; W. D. Frison, of Paola; Geo. W. Kanove, of Sedgwick; H. J. Allen, of Olathe, and H. A. Cherry, of Kansas City. T. L. Ryan and Howard Dunlap remain in the company. Frank Brown was elected president of the company, and Howard Dunlap and T. L. Ryan still hold the offices of secretary and treasurer. The reorganized company purpose to make a great many improvements in the plant, the first of which will be the putting in of seven miles of cable.

MONTICELLO, N. Y.—The Monticello Telephone Company has purchased of H. S. Wells, of Ellenville, the telephone lines in the village of Monticello and the lines to Kiamasha Lake and South Fallsburgh, which were formerly owned and operated by the Delaware River Telephone and Telegraph Company. The lines are now being put in shape and will be in working order to Kiamasha and Fallsburgh in the near future.

GROVER, N. C.—D. R. Bell has sold a two-third interest in the Grover Telephone Company, to J. F. Chipperfield, of West Virginia. Mr. Bell will continue as manager and expects to make some decided improvements on the line in a short time.

Construction

DAYTON, IND.—The Lafayette Telephone Company has extended an Independent line to this place and will form a central with connection on the "Farmers Co-operative" Pike and Eckart lines.

ELKHART, IND.—M. I. Pancake, of Dunlaps, will start work on the construction of a telephone system in the vicinity of Dunlaps, with headquarters in the latter place. He will have direct connection with Elkhart through the Home Company's exchange, and expects to connect with Goshen later. He will start with about forty subscribers.

FAIRMOUNT, IND.—The office fixtures of the Fairmount Telephone Company are being moved into its new home. Thousands of dollars have been spent on the plant since it came into possession of the United Telephone Company the first of the year. During the summer several men have been at work stringing a large amount of cable, setting new poles so as to have the wires above the treetops wherever possible, all work being done with the idea of making it permanent and giving the best of service.

LOGANSPOUT, IND.—Over two hundred subscribers to the Home Telephone service are waiting for connections. The company is enlarging the capacity of the plant as rapidly as possible, and hopes soon to be able to accommodate all comers. The business of the Home Telephone Company far exceeds expectations.

PEKIN, ILL.—A new telephone line is about to be built from Tremont to Pekin, in the interest of the McLean County Telephone Company. The Pekin and Tremont line is an Independent one, controlled by Tremont parties and connected with the Tremont telephone exchange. This new line will make two competitors for the Central Union.

PEORIA, ILL.—The Citizens' Telephone Company has a large force of men stringing wires toward Spring Lake. The company is rapidly extending its service.

BUFFALO, IA.—The new local and long-distance telephone line has been nearly completed.

DAVENPORT, IA.—As soon as the material arrives the Independent Telephone Company will start a force at work laying the conduits for their system. Nearly 2,500 poles will be set up as soon as they are distributed. The company will decide on the number of instruments to be ordered very soon, as the solicitors have about completed their work.

DES MOINES, IA.—George N. Bandy, owner of the Hawkeye Telephone Company, which is to remove its headquarters to Des Moines from Perry, and who has recently acquired an interest in the Mutual Telephone Company, has commenced the work of covering Polk County with farmers' telephone lines. Mr. Bandy said: "We have put out our solicitors to secure subscribers with the service and are meeting with excellent success. Just at present we are working in the vicinity of Clive. We have secured a large number of farmer subscribers in that locality, and will put in the service as rapidly as we can get material on the ground. In constructing the farm lines, we will use party line service so as to make the rentals low and to reduce the cost of construction and maintenance. At Grimes the work is now well in hand. A farm system has been constructed there by A. A. Repass, which has service extending to the farm houses of about every farmer who has business with Grimes. This line extends through the country as far west as Dallas Center."

ELDRIDGE, IA.—A new telephone line is being constructed through here to Dixon.

BATESVILLE, KAN.—Ned Glenn, manager of the Batesville Telephone Company, has sent out a large force of hands on the Melbourne line for the purpose of putting that line in first-class condition.

WELLSBURG, IA.—The new Mutual Telephone switchboard is now installed, and it is hoped that connections will soon be made with all other towns on the Mutual lines. About twenty parties have signified their intentions of putting telephones in their residences and places of business and others are sure to follow the example.

VINE GROVE, KY.—The Home Telephone Company is distributing poles through this section and will soon have its system in operation.

SOUTH SMITHFIELD, ME.—The telephone line has been extended as far as South Smithfield post office, and instruments placed in several houses.

CHESTER, MASS.—Middlefield people are trying to get a telephone line run from Chester. Superintendent Daboll has had the manager of the Westfield office go over the line, and a proposition has been submitted to the people whereby the town must set 250 chestnut poles and give the telephone company the right of way free. The telephone company will string the wire and maintain the line.

NEWTONIA, MO.—J. B. Hancock and others are constructing a telephone line to Wanda. This will give connection with Stella, Waddill, Rocky Comfort, Christopher, Sweetwater and Neosho on south line and Ritchey, Granby, Neosho, Diamond and other points on north and west directions. The poles are being put up and the line will be in working order soon. This gives the whole mail route telephone connection with the railroad, and will be of great benefit to the business men along the line.

LEWISTOWN, MONT.—The construction of the Lewistown-Grass Range telephone line is progressing finely. The work of setting the poles has been begun, and the line will be completed and put in operation at once.

BILLINGS, MONT.—Work has been commenced on the construction of the new telephone system under the franchise granted to L. L. Moffett by the City Council. The work is in charge of E. M. Hungerford, an old-time electrician and builder of the first telephone line in Billings. Nearly all the material for the new line is on the ground.

COZAD, NEB.—The directors of the Cozad Mutual Telephone Company, recently incorporated with a capital of \$2,500, have placed an order for sixty telephones, a switchboard and the necessary poles, wire and appurtenances to build and equip a complete system, which is expected to be in running order by Sept. 1. A number of farmers' companies in this vicinity have also been organized, and these companies have also ordered the necessary material for about 100 miles of line. The new system, including town and country lines, will aggregate 150 telephones, and all lines will be connected.

BROWN MILLS, N. J.—Work has been commenced on the lines of the Farmers' Telephone Company, recently organized to operate a system in some of the towns around Brown Mills.

DUNRAVEN, N. Y.—The Andes and Delhi Telephone Company is extending its line from Dunraven to Weaver Hollow.

EAGLE BRIDGE, N. Y.—M. W. Hicks has a large gang of men setting poles for the Granville Telephone Company between Eagle Bridge and Cambridge.

ITHACA, N. Y.—The contract for the construction of a toll line service between Ithaca and Cortland has been signed. The toll service will connect the Independent companies of Ithaca and Cortland, and will also afford telephone service for the farmers and villages between the two cities. Stations will be erected at numerous points along the line. Etna, McLean and other small places will be placed in direct communication with the two cities. It is also probable that branch lines will be extended to the various towns near the route.

DEVILS LAKE, N. D.—The poles for the telephone line here are being placed in position.

AMELIA, O.—The Citizens' Telephone Company will locate an exchange here. There are now forty subscribers. New connections have been made with Lebanon and other points in Warren County, where 700 telephones are in operation. The line also runs to Hamilton in Butler County.

BLOOMINGVILLE, O.—Work on the construction of a telephone line from Bloomingville has been commenced by the Home Telephone Company, of McArthur, and will connect with the long-distance lines of other companies in this city and Tarlton. The line will go up the valley from Bloomingville, following the Lancaster & Hamden Railroad, and the old line constructed by that road will be utilized as much as possible. It will connect with the lines of the other companies at Tarlton. From Bloomingville east it will traverse the oil fields of western Hocking and connect with the lines of the Logan Company at New Plymouth. The gap between Logan and New Plymouth will be built to connect with the two long-distance lines in Logan.

JACKSON, O.—S. C. Gilbert, of the Jackson County Home Telephone Company, will probably build lines from here to Wellston.

NORTH LIMA, O.—Manager Samuel Culp, of the Beaver Telephone Company, with a force of men, is stringing wires and installing instruments, preparatory to opening up for business. When completed, North Lima and vicinity will be equipped with excellent telephone service. Under the management of Mr. Culp, the subscribers are assured of good services and courteous treatment. The project starts with about 100 subscribers.

ORRVILLE, O.—The W., O. & M. Telephone Company has placed a new switchboard in its exchange with a capacity of 400 telephones. The company now has 215 private telephones with orders for 25 more, which will be put in as soon as possible.

SPRINGFIELD, O.—The Springfield and Xenia Traction Company is putting in telephones along its line for the new system, which is to be started between this city and Xenia.

THE WEEK'S MESSAGES *Concluded*

CHANDLER, OKLA.—A rural telephone line is being built from Chandler to Parnell.

NORTH WALES, PA.—The Montgomery Telephone Company is extending its line to North Wales and Lansdale. It now has a line running through Worcester, Towamencin, Skippack and other townships in the central part of Montgomery County. It was started by the Farmers' Union of Worcester. Nearly every farm in that township has a telephone. While it was built for local use only, it is likely that the line will be connected with one of the larger systems operating through the county. The charge for service is \$12 per annum.

WASHINGTON, PA.—The Federal Telephone Company is erecting poles through South Canonsburg and the old borough to the central office. This line when completed will give Canonsburg connections with Washington and the towns in the Monongahela Valley.

CHAMBERLAIN, S. D.—The directors of the Interior Telephone Company have just held a meeting in this city at which it was decided to extend the long-distance telephone line now in operation between this city and Bresho, on from that point to Fort Pierre, a distance of about forty-five miles. Other extensions to important intervening points are being planned, and before fall it is likely that the entire range of country west of the Missouri River will be in convenient touch with the outside world.

CHATTANOOGA, TENN.—An Independent telephone exchange will probably be built here.

WOODSTOCK, VA.—Mr. Fogal, the manager of the Shenandoah County Telephone Company, was in Woodstock improving the lines. He will shortly begin putting up a through wire from Strasburg to New Market, upon which there will be no telephones. This wire will be put up in order to afford not only those living below and above the county, but to all in the county through connections without interruption.

Miscellaneous

CENTER, COL.—The Farmers' Union telephone line is now connected between Saguache, Del Norte and Center, and the line will shortly be completed to Monte Vista. The system now is composed of about sixty-five miles of line. A switchboard will be put in at the La Garita ranch, which will make the line in four or five divisions.

WINONA, MINN.—The lines of the Greenwood Prairie Telephone Company have been extended to a connection with the Winona Telephone Company and a number of additional points can be reached by the Winona exchange, including Plainview, Kellogg, Weaver and Thielman.

LEAKESVILLE, MISS.—The wires of the Merrill and Leakesville Telephone Company have been brought into this place. Hitherto there has been no possible outside communication from this place other than the mails, going via star route, which was necessarily slow. The company was organized by the business men of Merrill and Leakesville.

TROY, N. Y.—The Home Telephone Company expects to begin placing telephones in position in a few weeks. The company claims to have 550 local subscribers. The switchboard has arrived and will be installed immediately.

ST. JOHNS, NEW BRUNSWICK.—The Parrsboro Telephone Company has completed its line to Amherst. This gives connection with Parrsboro, Athol, Southampton, Spencer's Island, Fox River, Apple River, Diligent River, River Hebert and intermediate towns.

TRENTON, N. J.—As a result of the railroad strike in Chicago and the consequent tie-up of the freight service, the Interstate Telephone Company was unable to carry out its intention of having its system in operation by Aug. 1. It is expected, however, that many of the telephones will be in operation by Aug. 15, and by Sept. 1, it is thought, 500 instruments will have been connected. The switchboard will have a capacity of 4,800 lines. The company hopes to have 5,000 telephones here in three years. The long-distance line will be in working order by the first of the year.

TOLEDO, O.—General Manager Hamlin, of the Home Telephone Company, expects to see service established soon. Electricians and linemen are testing the cables and wires. The operating room and switchboard is completed. It contains 6,000 connections.

EDISTO ISLAND, S. C.—The Gordon Telephone Company, which has constructed a complete system in the sea island territory, has added Edisto Island to the list, and the entire coast district is connected with the local exchange. Reginald F. Fennell is general manager of the Gordon Company, and president of the Island Telephone Company.

Personal

FLAGSTAFF, ARIZ.—F. C. Watson has resigned as manager of the Flagstaff Mutual Telephone Company. He will be succeeded by James McKinney.

HENDERSON, KY.—L. T. Nolin, of Louisiana, Mo., has accepted the management of the Henderson Telephone and Telegraph Company in order that J. W. Walker, the present manager, may take a much needed rest.

ST. PAUL, MINN.—W. J. Bell, of Baraboo, Wis., one of the State officers of the Wisconsin Independent Telephone Association, is here in the interest of long-distance toll-line connections with St. Paul, Minneapolis, Duluth, Superior, Milwaukee and Chicago.

HEMPSTEAD, N. Y.—George D. Smith, Jr., secured a position with the South Shore Telephone Company, as superintendent of construction.

NEWARK, O.—Charles E. Hollander, who has been superintendent of construction of the Columbus, Buckeye Lake and Newark Traction lines, has accepted the position of manager of the Newark Independent Telephone Company.

TEMPLE, TEX.—W. L. McLaughlin, who has been connected with the Independent Telephone Company in this city for the past, few months, has been recently promoted to the managership. H. H. Allen, the outgoing manager, has been promoted to the head of the soliciting department, covering this and other cities.

WOODSTOCK, VA.—J. R. Kemper has resigned the presidency of the Virginia Long Distance Telephone Company. N. C. Watts is now president, general manager and treasurer of the company. Mr. Watts is also owner of the exchange at Staunton.

TRADE NOTES

G. M. GEST, the subway contractor, has been awarded the contract for the additions to the underground subway system of the Edison Electric Illuminating Company of Brooklyn.

THE SWEDISH-AMERICAN TELEPHONE COMPANY, Chicago, has opened a branch office in the Stevenson Building, Indianapolis, Ind. Mr. E. B. Overshiner is in charge, and will look after the interests of the company in Ohio, Indiana and contiguous territory, where the demand for telephonic apparatus is steadily on the increase.

THE STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY will have a special track built by the New York Central & Hudson River Railway to its factory at East Rochester, N. Y.

PLANTS FOR SALE

TELEPHONE PLANT FOR SALE—160 telephones, 100 miles of toll lines; excellent opportunity for extending business; will sell for \$12,000; pays 15 per cent. net on this amount. Address TELEPHONE CO., care of AMERICAN TELEPHONE JOURNAL.

FOR SALE.—\$20,000 will buy a first-class, remunerative Western toll line; part payment only, cash; good reasons for selling. Address G. R., care AMERICAN TELEPHONE JOURNAL.

WANTED

SUPERINTENDENT of construction company, position as superintendent or manager of exchange of 1,500 subscribers or more; gilt edge references furnished. Address SUPERINTENDENT, AMERICAN TELEPHONE JOURNAL.

POSITION with Electrical or Telephone Manufacturing Company, by an expert battery-maker Twenty-two years old; good references furnished. THOS A. LOUGHRAN, JR., 28 Romaine Avenue, Jersey City, N. J.

WANTED.—Position as wire chief or manager of an exchange of 1,500 or 2,000 subscribers in a clean Western town or city by a married man of temperate habits, with twelve years experience with the Bell Co., but now taking care of an exchange district with 1,500 subscribers for an Independent Co. Can give good references. Address L. M., AMERICAN TELEPHONE JOURNAL.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISSELL CO., Toledo, Ohio.

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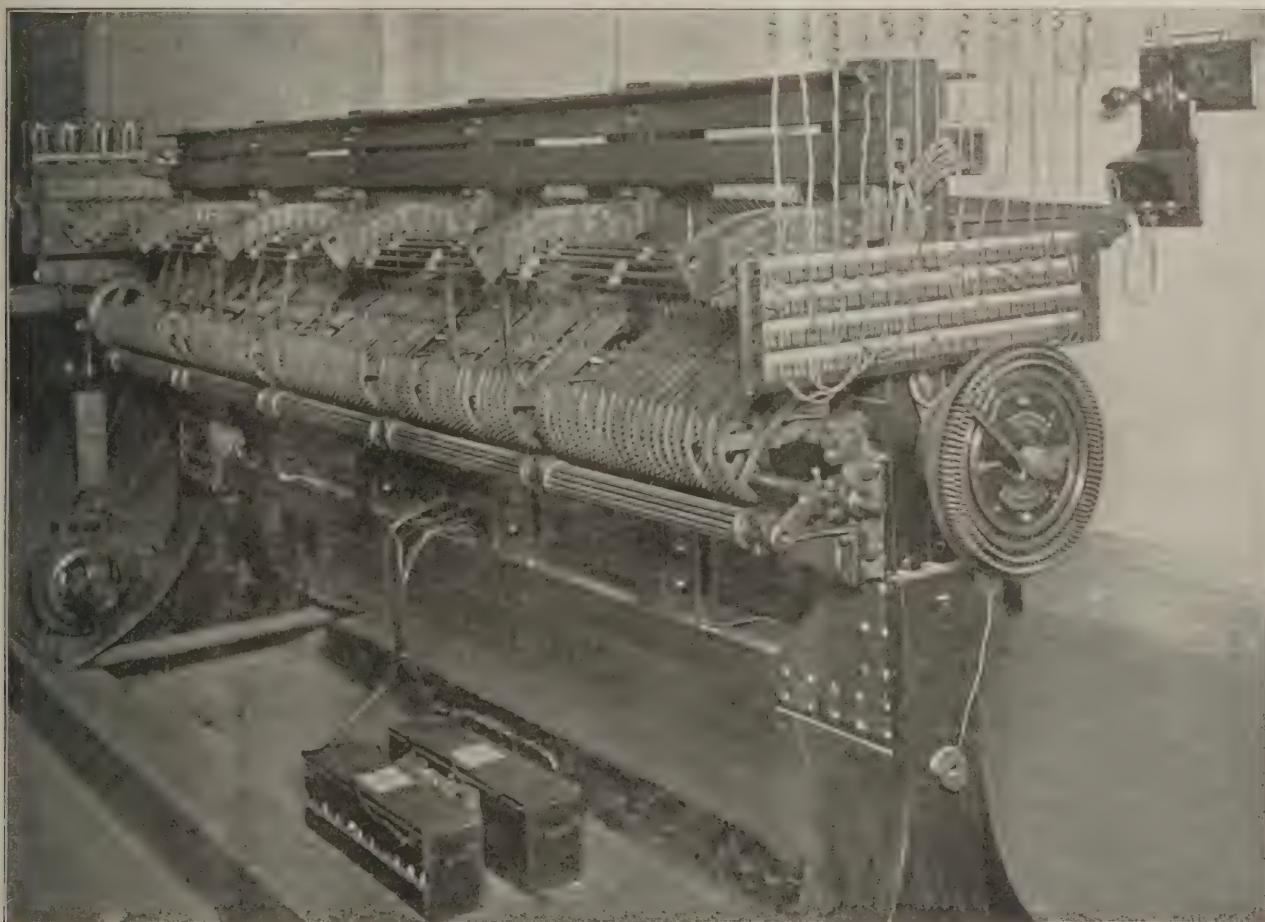
MANUAL vs. MECHANICAL OPERATING, ARTICLE I.

THE FALLER SYSTEM.—By ARTHUR VAUGHAN ABBOTT, C. E.

IF THE Nineteenth Century can be termed the Age of Machinery, the Twentieth Century will equally merit the name of the Age of Automatic Machinery. Put a penny in the slot and one may get a selection of chewing gum, ascertain one's weight, view the bones of one's hand illuminated by the X-rays, or receive a completed photograph of one's self, taken, developed, dried and delivered entirely automatically in the space of a few seconds. In the manufacture of watches automatic machinery has received its highest development. Put a bar of steel into one end of the machine, and from the other will issue completely formed watch gears, cut with almost mathematical precision.

under the name of the "Faller System," now presents itself to the telephonic fraternity. For several reasons the invention of Dr. Faller is unique, and its many points of merit are well worthy of careful study by those interested in this branch of telephony.

The first, broadest and most salient claim to originality of the Faller System is that it is not a mechanical *switchboard* at all, but is a mechanism that performs automatically exactly the same avocations as the regular operator, in the same order and manner as they occur in the manual switchboard. Thus, in fact, the apparatus is a *mechanical operator*. It is in this respect that the Faller invention is entirely different from and in many respects



FALLER MECHANICAL OPERATOR. FIG. 1.—Shows commutator, terminal board, subscribers' shuttles, some with connection established, shuttle locks which keep connection established until cleared out, and lantern pinion which brings shuttle to proper position for connection.

Among the developments of automatic machinery, the efforts to make operatorless telephone exchanges are exceedingly interesting, the Patent Office records teeming with all sorts of devices to enable "*every man to become his own operator*."

The Strowger Automatic Switchboard is probably the oldest of these devices, has attained the greatest success, and is the most widely known. Though it has been before the public for nearly a decade, its headway has been slow, and it is doubtful if a tenth of 1 per cent. of the telephone subscribers in America are served by automatic switchboards. Within the last few months another effort has been made to devise a mechanical switchboard, which,

superior to other devices for automatic telephone service. It is difficult if not impractical to convey a clear conception of the apparatus without a working model, as even the best drawing or picture would be inadequate for the purpose.

Probably the best general idea can be gained by comparing the machine to a Jacquard loom, wherein the various subscribers' lines take the place of the threads of the woof, while a kind of carriage plays the part of the shuttle, temporarily weaving metallic threads between such pairs of woof threads as wish to converse with each other. Indeed, the analogy may be carried to a classical point in the resemblance of the shuttle to Penelope, for it pulls

out the metallic connection and restores the woor to its normal condition as soon as conversation has ceased.

The avoidance of all electro-magnetic mechanism that is called upon to exert any power is another exceedingly meritorious feature in design. The Faller board is driven by a prime mover of some sort, such as an electric motor, a small steam engine, countershaft, or the like, that is capable of supplying an ample amount of power, so that all that the electro-magnets employed in the machine are called upon to do, is to act as releases—starting and stopping the various portions of the mechanism at the proper times. Thus there is no danger to be apprehended from a failure of motive power to cause the apparatus to perform its functions promptly and in the desired manner. By supplying plenty of power, all portions of the apparatus can be made solid and substantial in all respects; contacts may be given any desired amount of pressure designed on the rubbing plan, and a host of similar advantages utilized.

At each sub-station the subscribers' instrument is provided with a calling device that consists of as many discs, or contact wheels, as there are significant figures in the highest number in the exchange. For example, in an office of 1,000 lines each subscriber would have three discs—one for units, one for tens, and one for hundreds. To call, say 485, a subscriber would set the hundred wheel at four, the ten wheel at eight and the units at five, and press a button. This momentarily grounds the line and allows the sender, which is in reality nothing more than the old familiar step-by-step movement so often weighed in the balance and found wanting, to transmit a series of impulses to the office corresponding to the numbers indicated on the several dials. Now, it is not difficult to imagine an electro-magnetic receiving mechanism so arranged as to enable the shuttle to pick out the subscriber's line thus specified and make connection therewith. When this is accomplished the bells of both subscribers ring as a signal to each that mutual connection is established and conversation can be commenced. When the message is completed the replacement of the receivers upon the respective switch hooks releases the shuttle and allows it to return to its normal position, thus placing each line in condition to receive another message. By having a number of shuttles, each of which takes the place of a single operator, as much business can be handled as it is possible to transact over the individual lines. By a very ingenious arrangement a busy test is so applied that if the shuttle finds a desired line already engaged in conversation it returns to its normal condition, the bell of the calling subscriber fails to ring, thus notifying him that the party desired is already engaged in conversation, and the call must be repeated at some subsequent time.

The Faller operator is substantially and solidly constructed. It is designed by excellent machinists, and from a mechanical and electrical standpoint leaves little to be desired. It appears to be decidedly simpler and cheaper in initial construction than any of the previous forms of automatic switchboards which have made their appearance. The following comparison has been made between an installation for 900 lines upon the Strowger and upon the Faller plans, and may be interesting as exhibiting relative complexity:

Comparison between the number of pieces in a 900-line board on Strowger and Faller plan.

	Strowger.	Faller.
Number of contacts.....	367,092	12,000
Number of switch machines.....	1,188	10
Number of relays.....	2,526	0
Number of local batteries.....	1,800	0

Automatic switchboards are usually alleged to possess one or

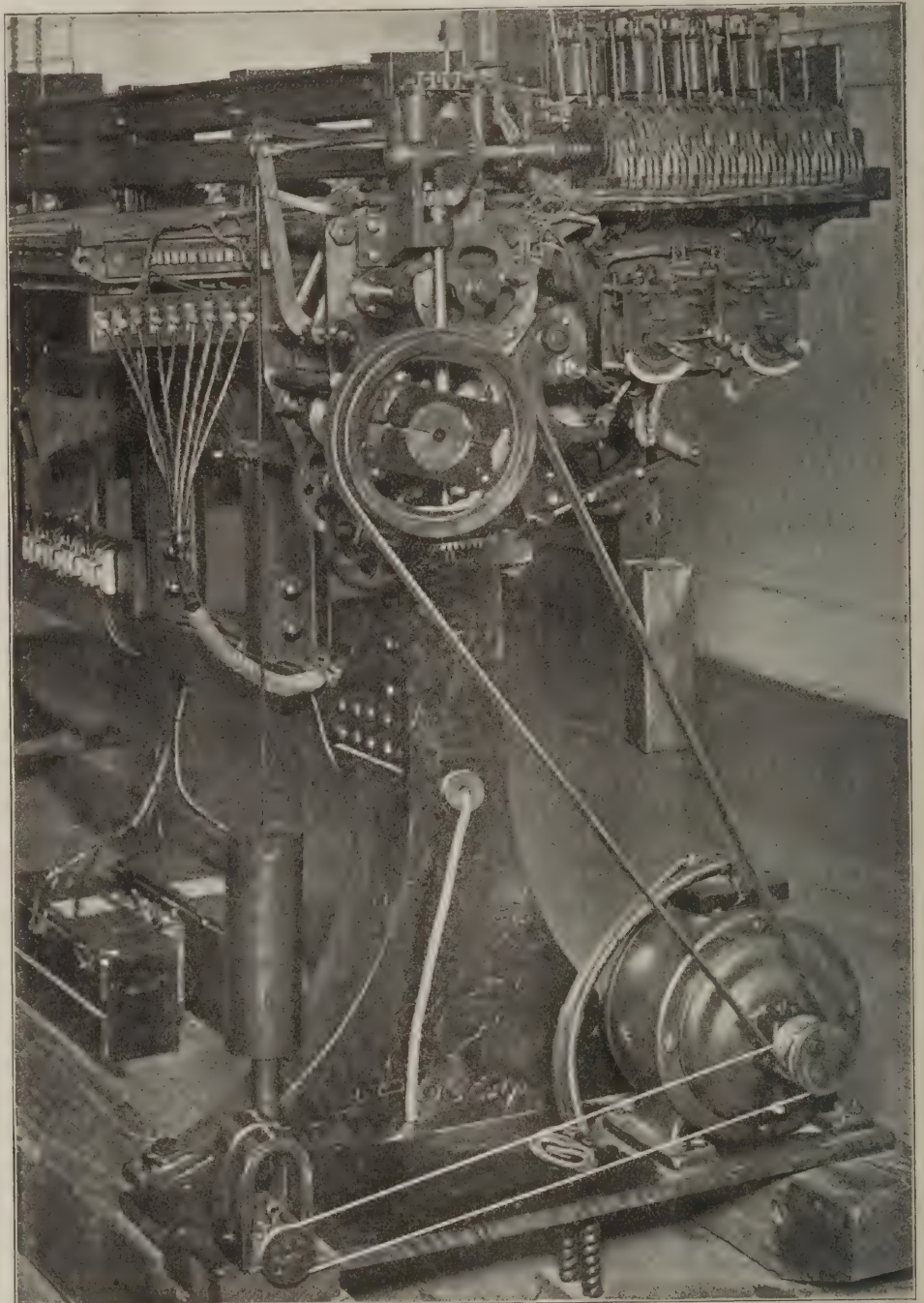


Fig. 2—Shows busy test, trouble detector, magneto generator, motor, working mechanism, and busy wheel, which obviates all line magnets using only one magnet.

FALLER MECHANICAL OPERATOR.

all of the following advantages over manual ones:

- First—Cheaper installation.
- Second—Cheaper operation.
- Third—The ability to give better service either in speed or reliability.

The Faller board, as so far exhibited, is planned in units of 100 lines each, but it is stated that only a single model has been made, so it is not as yet possible to quote prices for the apparatus from actual experience in manufacture. Good 100-line switchboards may be purchased from a number of reliable manufacturers for \$300 or less, and it appears doubtful if further experience can demonstrate the possibility of making the Faller board with the degree of thoroughness that such apparatus demands, and sell the

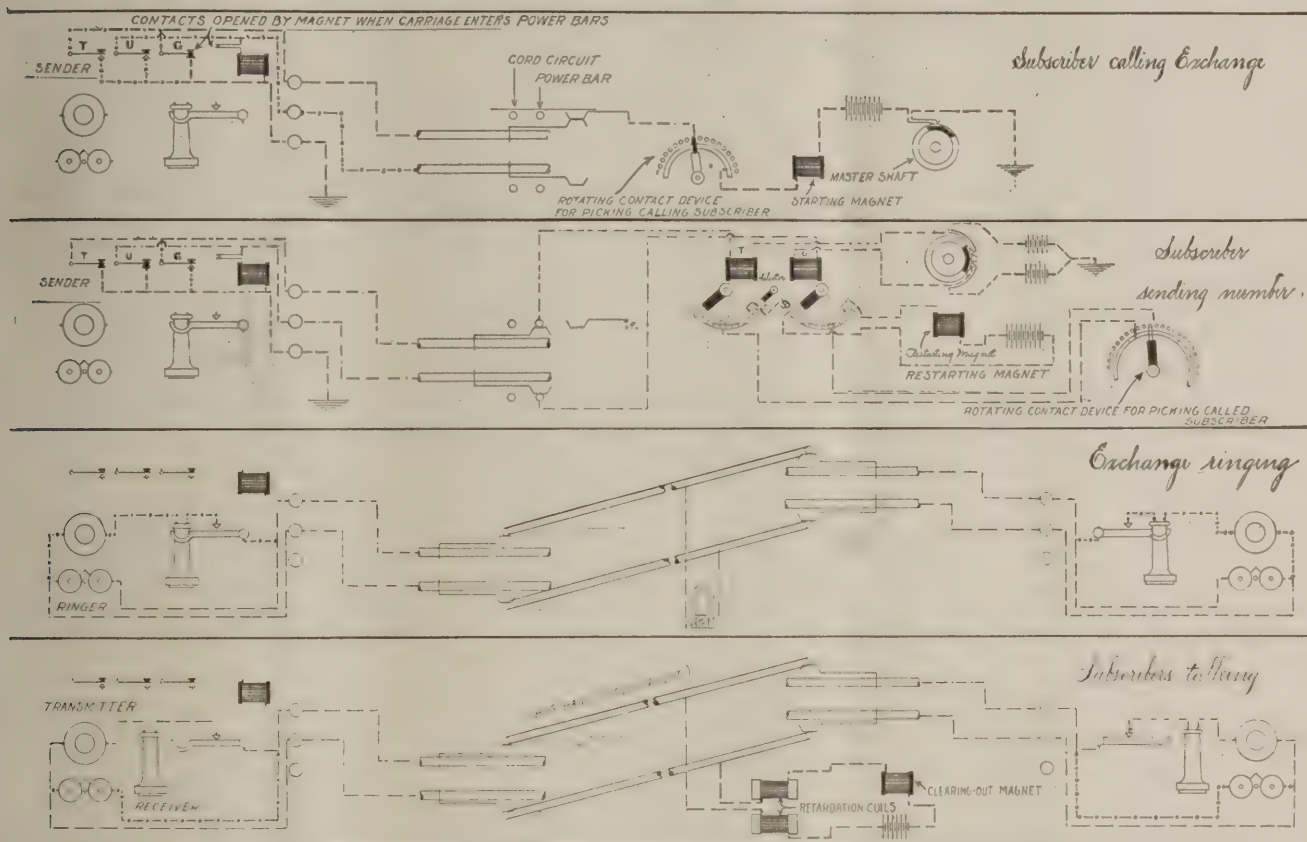
same—including probable profit and patent royalties—at a price that will enable it to compete with the rates asked for manual sections. It is well known that the cost of multiple switchboards of large size increases very rapidly with the size of the board, owing to the expense of multiple jacks. In days past, when jacks were sold for \$1 apiece, this was a forcible argument, but at present, allowing for busy exchanges but fifty lines to an operator and assuming multiple jacks to cost but 15 cents each, the expense of the multiple portion of a 10,000-line switchboard would be \$10 per line, or \$1,000 for the equivalent of one Faller section. Possibly—nay, probably—a Faller board could be sold profitably at this price, but the number of switchboards of the capacity of 10,000 lines is so rare that all such installations may be easily counted on the fingers of one hand, and with smaller boards the handicap of the cost of multiple jacks soon decreases and becomes inappreciable.

In different places the amount of these several items will vary, but in a general way they will stand something as follows in large offices for every 1,000 messages transmitted:

Item.	COST OF TRAFFIC.		
	Originating calls.	Trunk calls.	Total per M messages.
Labor	1.50	.70	2.20
Rent, light, heat.....	.15	.10	.25
Executive force	.50	.40	.90
Incidentals	.60	.30	.90
Total	2.75	1.50	4.25

In an exchange handling 100,000 calls per day the operating expense would amount to \$425, and some persons jump to the conclusion that all of this expense would be abolished by the sub-

DIAGRAM SHOWING CIRCUITS OF THE FALLER SYSTEM.



IMPORTANT NOTE—In this diagram all APPARATUS is shown in solid lines. WIRING is shown in dotted and broken lines. BROKEN LINES show that part of the wiring on which circuit is closed. DOTTED LINES show wiring on which circuit is open.

As but a single 100-line section of the Faller board has been constructed, the apparatus has never been tested even experimentally in larger units, and the question of trunking between sections when more than one is employed is unsolved excepting on paper. There the solution looks easy, as drawing-board problems frequently do. Consequently, considering cost of installation, the question is that of estimated expense on the one side, over practical experience on the other, and, to use a mining phrase—"the mill returns of an ore never reach the value of the fire assay." It is at least conservative to discount a little the somewhat excessive claims made as to economy of installation, as it is impossible to verify the optimistic assertions of probable saving. Naturally, the abolition of the familiar "hello girl," with all her alleged imperfections and the substituting of a service that is clock-like in regularity, is the chief claim of every automatic switchboard. In large exchanges the expense of serving the switchboard is often divided into four items:

First—Cost of labor.

Second—Rent, light and heat for the space occupied.

Third—Cost of the executive staff—manager, etc., and

Fourth—Incidentals.

stitution of an automatic switchboard. But, consider—a 100-line Faller section occupies about four times the space taken by 100 lines upon an ordinary manual board; it is not possible to put it in a dark room, as some attendance is constantly required; nor is it possible to put it in a cold room for the same reason, and it is inadvisable to put it in a poorly constructed building on account of fire risk. Rent, light and heat, therefore, will not be sensibly decreased per unit of floor space. As the board occupies four times as much space, this expense will be increased proportionately, and this item must be charged at \$1. No economy can be made in the executive force, as every exchange—automatic or otherwise—requires the services of a manager and his staff in order to deal with the public. Further, though automatic machines require less labor than those which are not automatic, the kind of labor needed is of a higher class and demands a correspondingly increased rate of pay, so that it is fair to double the cost of executive force, allowing \$1.80 for this item. Incidental expenses will be decreased, but, as an offset, power must be supplied to operate the Faller board, so that perhaps it is not unfair to allow the same amount for this item. The expense of labor may be credited as a clear gain. Thus, the cost per 1,000 mes-

sages would stand at \$3.70 for the mechanical operator, against \$4.25 for the manual board—a saving of 55 cents per 1,000 calls. Now, it is a question for experience to demonstrate whether the interest, maintenance and depreciation upon the probable increased cost of installation will not wipe out at least a portion of this saving.

There remains the question of the ability of the automatic switchboard to afford a preferable service, and doubtless there will be two opinions in regard thereto. The advocates of the automatic can fully substantiate the claim that service will be more *regular* or uniform, and there is no gainsaying this argument. From the standpoint of speed the automatic exchange probably will *average* a service as rapid as that attained in common practice throughout the country. But in busy city offices, where, during the peak of the load, calls come in very rapidly, the automatic board will fall considerably behind the speed attained in the best modern exchanges under first-class operating management. If calls arrive more rapidly than they can be answered the machine very ingeniously stores them and continues to complete connections as fast as it can until all are answered. But subscribers want immediate service, and will not brook delay, particularly in the absence of a pacifying explanation, and this the machine cannot give.

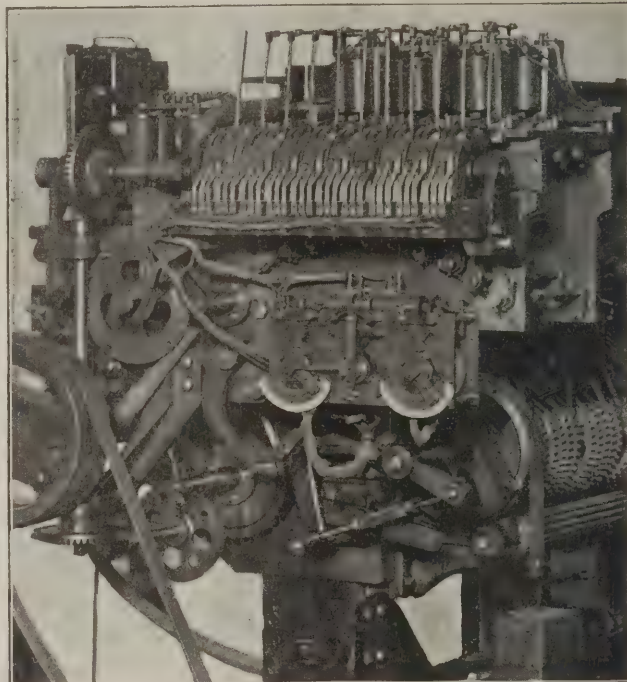
The tendency in modern telephone practice is to relieve the subscriber as far as possible from all the work of obtaining a connection. This is partially the cause of the extensive development of the private branch exchange. Large business houses install their own switchboard and train their operators to get for them the various correspondents with whom they most frequently transact business. In many instances this service is so extended that the operator finds in the directory the numbers of desired parties. The operation of an automatic switchboard, on the other hand, inflicts upon the subscriber a greater amount of labor than with the manual board, for the calling subscriber must not only ascertain the number of his desired correspondent, but must manipulate the step-by-step mechanism in order to obtain the exchange. In small towns this may not be a serious handicap, but it is doubtful whether the modern business man would tolerate for a moment the additional labor, and he would certainly be very intolerant of the greatly increased number of errors which would occur from an attempt to perform this service for himself.

In the event of injury to a subscriber's line or to any portion of a manual switchboard, such as a cord, plug, jack, etc., either from accident or due to natural wear and tear, only the particular piece of apparatus incapacitated is thrown out of service, and the intelligence of the operator enables her to substitute duplicate parts from the reserve of her own cord shelf or borrow from her more fortunate neighbors on either hand. In the automatic, a ground on a subscriber's line or the failure of any part of a far more intricate and delicate mechanism puts a hundred lines *hors du combat* until relieved by the intervention of a particularly skilled attendant. Such an incident, which must be of more or less frequent occurrence, will cause most exasperating delays, particularly if happening at the busy hour.

Of the phonograph it was at first predicted that it would be extensively used in dictation, taking the place of the stenographer. Experience has not fulfilled this prophecy—not from any inability of the machine to faithfully record what is spoken to it, but its very mechanical precision prevents it from performing the service for which the stenographer is most valued—that of transcribing not what the dictator *said*, but what he *meant* to say. There are countless mechanical contrivances for the reproduction of music, from the music box at the head of the list to the organette, with its spool of paper, at the other end, but in spite of the mechanical

precision with which sounds can thus be reproduced, the great masters of the piano receive year after year the most cordial welcome and the public pay fabulous prices to listen to their performances.

The camera will in a flash of a second reproduce with mathematical fidelity the finest detail of the most intricate scene. But photographs are rare than can be placed beside a Corot or a Turner. The animal studies of Muybridge are absolutely correct, but one hangs a Rosa Bonheur on the walls of a drawing-room. Ruskin says: "Art is nature seen through temperament." So with the telephone exchange—that service *can* be given mechanically is certainly true; that it *will* be is at present doubtful, and that most subscribers desire such service is untrue. It is "service through temperament" that is wanted, for experience shows that the human element, as in many other cases, is desirable, and, like the picture or the symphony, commands a higher price.



FALLER MECHANICAL OPERATOR, FIG. 3.
Shows selector, ringing cams, and clearing out magnets.

It is by no means intended to convey the idea that mechanical operation is impossible. Many conditions are conceivable under which it might not only be possible but desirable. But such cases are the exception and not the rule, and must be decided each for itself on its own merits. They are not as yet sufficiently developed to have accumulated any experience either as to cost of installation, cost of operation, cost of maintenance, or acceptability of service. To install a Faller operator is to try an experiment, pure and simple—a very interesting one, perhaps, but still an experiment, not a commercial undertaking. Those who are interested in the development of telephone apparatus can hardly find a better or more promising field in which to expend time, energy and money, but those who are in the business of operating to give commercial service and earn dividends had better allow "some other fellow" to do the experimenting.

A FOUR HUNDRED THOUSAND DOLLAR BOND ISSUE

THE Union Electric Telephone & Telegraph Company, of Rock Island, Ill., has authorized the American Trust & Savings Bank, of Chicago, to secure an issue of bonds amounting to \$400,000. This company will build and operate systems in Rock Island, Moline, Ill., and Davenport, Ia. Mr. N. Hamilton, president of the company, in speaking of the reason for taking the above action, said:

"The company requires money to pay for materials and construction work, and the proceeds of the bonds authorized to be issued under the mortgage recorded to-day will be partly applied to construction of three up-to-date plants in the tri-cities, not only aerially and underground, but also in the erection and equip-

ment of three modern exchange buildings of brick and stone. The balance will be used later on for the purpose of securing additional territory and adding future betterments as they develop.

"The bonds are in denominations of \$500 and \$1,000 each, run for 20 years from to-day and pay 5 per cent. yearly clear of all taxes, semi-annually on Feb. 1 and Aug. 1 of each year, the trustee for them being the American Trust & Savings Bank, of Chicago, Ill.

"While the actual construction of the company's plant has been under way for several weeks past in both Rock Island and Moline, work will be commenced and pushed in Davenport first.

BATTERIES FOR TELEPHONE WORK. VI.

MAINTENANCE OF FULLER AND GRAVITY BATTERIES.

THE efficiency of the Fuller battery depends largely upon the zinc being of good quality and being kept constantly thoroughly amalgamated. This is so because consumption of the zinc goes on even when the battery is not doing work, and if the zinc is of poor quality and contains foreign substances there will be extensive local action and the zinc will be rapidly destroyed. The consumption of the zinc when the battery is on open circuit is checked by keeping it constantly well amalgamated by means of maintaining a good supply of mercury in the porous cup. The carbon plates used for the Fuller battery are similar to those used for Leclanché cells; in very large-sized Fuller cells it is common practice to use several carbon plates connected together, so as to get a large collecting surface and so reduce the internal resistance of the cell. As pointed out in a previous article, the depolarizing solution is best made with bichromate of soda, as this material is superior chemically to bichromate of potash and is more soluble. The usual proportions of materials in the depolarizing solution are two parts of bichromate of soda, five parts of sulphuric acid and ten parts of water, all by weight. A half-gallon battery requires a solution made of six ounces of bichromate dissolved in about a quart of water with one pound of sulphuric acid added. The bichromate should be thoroughly dissolved in the water first and the acid added slowly in small quantities at a time; the dilution of sulphuric acid causes the generation of considerable heat, and if the acid is added to the solution too suddenly the rapid heating of the mixture is apt to crack the vessel. Sometimes chromic acid, which is sold in the form of a powder, is used for the depolarizer instead of bichromate of soda and sulphuric acid. The chromic acid dissolves in water, but it makes a more effective depolarizer if dissolved in diluted sulphuric acid, using a solution of about two parts of water to one of sulphuric acid. The solution generally used in the porous cup with the zinc element is of common salt, about three ounces of salt to a pound of water. Plain water in the porous cup will do almost equally well, as the acid depolarizing solution will percolate through the porous cup and acidulate the solution within, but generally the battery is set up with a weak exciting solution either of common salt or very dilute sulphuric acid.

To keep the battery working in good order the solution in the porous cup should be renewed occasionally and the zinc thoroughly cleaned; to do this it will be necessary, of course, to pour out the mercury from the porous cup, and the mercury should be saved and replaced, the quantity being added to, if it is found to have diminished much over the original amount. The state of the depolarizing solution will be denoted by its color; as it becomes used up it changes from deep red to brown, and when it is distinctly brown it is completely spent, and should be renewed. If the battery is left long in this condition dark crystals of chrome alum will form on the porous cup and on the jar, and it

will be much more difficult to clean the battery than if it is taken in good time. At a busy station Fuller batteries should be thoroughly cleaned and the solutions renewed about every two months, or at least five times during the year. If the station is a very quiet one the batteries may go on one charge for three or even four months. When the battery is dismantled for renewal of the solutions, the carbon plates should be thoroughly cleaned and the porous cup soaked and washed in clean water to get all the old solution out of it. At the end of a year's service it will generally be necessary to renew the zinc elements.

The chief point to look out for in setting up gravity batteries is to prevent mixing of the solutions, and no little care and dexterity will be required to do this. The solution of copper sulphate is a thoroughly saturated solution, and several pounds of copper sulphate crystals are placed in the jar to maintain the solution at the saturation point as long as possible. The copper solution should about half fill the jar; the weak solution of zinc sulphate is poured carefully in on top until a layer of zinc solution is obtained deep enough to cover the zinc element when it is in place. The battery must, of course, be set up in the place where it is to be used and left undisturbed as any movement of the cell would cause the solutions to mix. To replenish the copper solution the zinc solution should first be drawn off, which can be done with a battery syringe or syphon; the practice of dropping crystals of copper sulphate through the zinc solution is a bad one, as it causes a mixing of the solutions. When the solutions become mixed and the zinc becomes discolored, which will occur if the cells are moved or shaken, or if they are left long on open circuit, the solutions should be drawn off, the plates thoroughly scraped and cleaned, the zinc re-amalgamated, and the battery should be set up again with fresh solutions. Speaking generally, the gravity battery is not a good type of cell for telephone work, as it deteriorates so quickly on open circuit; its use is practically confined to situations where a continuous current is required, and for such purposes the motor generator and storage battery, now that electricity supply is so generally available, have largely put it out of business.

Summing up, too much care cannot be taken of the batteries in a telephone system. Scrupulous attention to quality of materials, to care and skill in setting up, and to systematic and conscientious maintenance and inspection will be handsomely repaid by results in the way of efficiency of talking. Attention to detail is the keynote of success in telephony, and no detail is more important than the battery which makes the transmitter talk. A very important detail is the protection of the battery from extremes of heat and cold, from dust and dirt, and from risk of accidental or mischievous disturbance. The proper place for the battery, of course, is as near the transmitter as possible to obtain a low resistance in the primary circuit, but wherever placed the batteries should be covered and should be free from extremes of temperature.

COMPETITION IN CANADA

BEAVERTON, ONTARIO, has an Independent telephone system, established in opposition to the Bell Telephone Company, and giving good satisfaction to those using its lines. The rate per instrument is only \$18 to farmers and \$15 to those residing in the village.

The new company is just a month or two old, and the telephones have been in operation only a little over a month. The high rates demanded by the Bell Telephone Company are at the source of its organization. Last spring the Eden Creamery Company, whose creamery is situated about five miles from Beaverton, applied to the Bell Company, and were asked \$60 a year for a connection. This rate the creamery company considered extortionate, and determined to see what could be done with an Independent concern.

A firm of Beaverton merchants and the farmers interested in the creamery joined hands and formed a private company, of which George A. Proctor, a farmer of Thorah Township, was a leading member. The low rates at which they offered to install telephones found a ready demand in the community, and there

are now between 20 and 25 instruments in operation. Those who have used both the Bell instruments and the instruments of the Independent concern affirm that the Independent line gives just as good satisfaction as the Bell, if not a little better.

The success with which the new company has met will be realized when it is known that within a couple of months they have installed as many telephones as the Bell Company has in operation altogether. The number of Bell instruments in use probably does not number more than 25, if it even reaches that figure. It shows what can be accomplished with telephones at reasonable rates.

The lines are not all completed yet, but the instruments already installed have proved the value of telephonic connection to the farmers, and further extensions will be made immediately. About 50 telephones will be put in this fall, and an equal number next spring. The system has, even in its early stages, given an indication of the possibilities of a rural telephone system in Ontario, and the same system will probably be applied extensively throughout the province.—*World* (Toronto, Ont.)

IN THE OPERATING FIELD

THE FRONTIER TELEPHONE CO.

NOT until Independent telephony was proven to be an unqualified success, did the conservative Eastern capitalists take hold of it. The experiments were all made in the West. The enterprising Westerners, after once embarking in the Independent field, have installed exchange after exchange, until now nearly every town in that section of the country has a telephone system, and toll lines form a network between towns.

But after such a long wait, the East has at last awakened to the fact that the West is far ahead in telephone development. It is characteristic of the East that once it does take hold of a movement, it is pushed along with a vim.

Now construction is progressing everywhere. New companies are being formed in towns and cities of all sizes. Especially is this true in Pennsylvania and New York. Among the most prominent companies in the former State may be mentioned the Keystone Company, of Philadelphia, which has only been in operation a short time, and already has over 6,000 subscribers; and the Consolidated Telephone Companies, operating in the northern part of the State, and having about 40,000 subscribers.

In New York nearly every city of considerable size has an Independent system either in operation or in process of construction. Toll lines are being built as rapidly as possible, thus giving connections between towns.

One of the largest companies building at present is the Frontier Telephone Company, of Buffalo. This company got a franchise in December, 1901, and work has been pushed ahead as rapidly as possible ever since. It paid \$25,000 for its franchise; is under a bond of \$100,000 to maintain competition in the city; will give the city \$5,000 worth of free telephones each year for public business, and besides this will pay to the city 3 per cent. of its gross revenue.

It is expected that service will be furnished subscribers by the last of November, as all the work is well under way. Over one-third of all the underground conduit work is completed, about 350,000 feet of ducts having been laid so far. The pole lines in the residence section are also nearly completed. The new exchange building, a handsome structure, is well under way, and the contractor says it will be ready for switchboard installation by the latter part of August. The multiple express switchboard will have an ultimate capacity of 18,000 subscribers' lines and will be 360 feet long, one of the largest of its kind ever built. The switchboard will be supplied by the Kellogg Switchboard & Supply Company, of Chicago, and the same company has also the contracts for the instruments, which will be of the standard central energy type.

The Frontier Company believes that better service can be obtained by having one main exchange to handle all the business, with no branch exchanges. This is why such a large switchboard is being put in. Mr. Wilbur H. Johnson, the superintendent of the company, in speaking of this, said:

"We have the advantage of the Bell Company's experience. When they commenced business here, they built an exchange only large enough for their immediate needs. When the business grew, it was necessary to build branch exchanges and lay new systems of conduits. This is very much more expensive than building on a large scale in the first place. We are constructing an exchange large enough to take care of 18,000 subscribers, giving every one an exclusive connection. By having only one exchange, we also save much valuable time in making connection.

"While the service of the Bell Company here is fairly satisfactory, we are determined to give much better service, and at lower rates. Our charges will be \$48 for business houses and \$36 for residences, with no party lines, and absolutely unlimited service. There will be no measured service, which the people here do not like. Our solicitors receive a cordial reception wherever they go. They are still canvassing the business section and will later go the rounds of the residence part of town. By the first of January we will have over 5,000 contracts. We expect to begin giving service by the last of November, and will make no charge until we have 3,500 lines in operation. At present there are only 10,000 telephones in use in Buffalo, but we are going to double this number soon, and treble it in the near future."

The officers of the Frontier Company are: E. C. Lufkin, president; John B. Weber, vice-president; Charles B. Hill, secretary and treasurer; Samuel E. Wayland, general manager; Wilbur H.

Johnston, superintendent, and G. A. Miller, contract agent. The directors are: E. C. Lufkin, John B. Weber, Charles B. Hill, Irving A. Stearns, Alvan Markle, Arthur Scranton, James M. Thomas, Fred R. Green, Henry H. Persons, H. D. Kirkover, William A. Douglass, Charles E. Austin, Martin Carey, and Charles W. Goodyear.

EASTERN OHIO TELEPHONE SITUATION

THE Independent telephone situation in Eastern Ohio, in Harrison and adjoining counties, is in splendid shape, and many of the companies are figuring on making extensive improvements and extensions.

The Bergholz Telephone Company, recently organized, has in contemplation the building of a toll line from Bergholz to connect with the exchange of the Harrison County Telephone Company at Jewett. The Harrison County Telephone Company has recently built a toll line to connect with the Junction Telephone Company at Cadiz Junction. The Phoenix Telephone Company has in view the building of a copper line from Steubenville to Wintersville, Ohio. In case this line is constructed, intermediate lines will build a metallic line from the latter place to Cadiz Junction. This will give full metallic connections between Steubenville and Cambridge, Ohio. Material is ordered for an exchange at Scio, Ohio, to be installed by the Harrison County Telephone Company, of Cadiz, Ohio. The Flushing Telephone Company has recently installed an exchange at New Athens, Ohio, the seat of Franklin College. They have 35 instruments working at the present time. The business has grown to such an extent in Eastern Ohio that the National Telephone Company, of Wheeling, W. Va.; the Belmont Telephone Company, of Bridgeport, Ohio; the Flushing Telephone Company, of Flushing, Ohio; the Union Telephone Company, of Fairview, Ohio; the Cambridge Telephone Company, of Cambridge, Ohio, and the Harrison County Telephone Company, Cadiz, Ohio, will, likely have an auditor appointed who will audit the toll business of the above named companies.—*Finance* (Cleveland).

LOWERING AN EXCHANGE

THE office of the Youngstown Telephone Company, Youngstown, O., is now on the second floor of the Dollar Savings and Trust Company's new block. Formerly it was on the third floor, but to secure additional room it was decided to move to the second floor. The task was done by an ingenious system of huge screws. A trestle work of timbers resting on the steel beams of the second floor was built around the office and into the top of this trestle were placed long bolts which were fastened into timbers extending under the office. The bolts were screwed up tight and held the office in place until the concrete floor was laid to receive the exchange.

ELECTION RETURNS BY TELEPHONE

THE telephone service of Union County, N. C., probably surpasses that of any other county in the State, especially in the rural districts. There are in the county ten telephone exchanges and six of these are in the country. The total number of telephones in the county is 542, and 295 of these are in towns and 247 in the country; and the system is yet in its infancy in the rural districts. At the present rate of increase the number of telephones in the county will probably be increased 100 per cent. within the next twelve months, and it is only a question of a short time before this county will be a network of wires and almost every farmer will have a telephone in his house. The telephone system, together with rural free delivery of mails, will revolutionize things in favor of country life, rendering it less isolated and more attractive. Even now all important news is transmitted to every part of the county as soon as it occurs. Two hours after President McKinley was shot at Buffalo, the affair was being talked about by our farmers through their neighborhood exchanges. During the recent Congressional convention at Monroe farmers sat in their homes and received the ballots as they were cast for the various candidates, and many of them knew who the nominee was before the first applause from the friends of the successful candidate had subsided.—*Our Home* (Marshville, N. C.)

CONTEMPORARY CROSS-TALK

IN our last talk we touched on the evidence bearing on the point that the line costs are a governing factor in determining the cost of carrying telephone messages, and branched off into an exposition of the fundamental difference between telephone messages and letters and telegrams which goes far to show why the line costs have such an important bearing on the price of telephone messages. A very superficial examination of the general aspects of telephony will discover plenty of evidence of the general appreciation of the fact that the line plays a predominant part in determining the cost of telephone service. To start with, we have the fact that, in the main, charges vary directly with the distance; suburban messages cost more than local messages and long-distance messages cost more than suburban messages. Then, almost since the beginning of exchange telephony, we have had constant endeavors to diminish the line costs per subscriber by putting two or more stations on one line. Since the general lowering of telephone rates that set in a few years ago, hosts of inventors have been busy devising systems of selective ringing and signaling aimed at freeing party-line service of some of its disadvantages. The demand for low rates is general, and low rates can be given only if low costs can be attained; as the line is the principal element of cost it is naturally the target at which inventors aim. The same object, the reduction of line costs, is apparent in the tendency to build cheap lines, to use iron or steel wire in place of copper, grounded circuits in place of metallic, light poles instead of substantial ones, and to overload pole-lines beyond their proper capacity.

* * *

This last-mentioned sort of work is false economy, but is merely another bit of evidence bearing on the point that the influence of line costs is widely appreciated if not thoroughly understood, for no economy can be a sound one if practised at the expense of the quality and permanence of the service, which are certainly endangered by the use of the cheap description of line just referred to. Another bit of evidence is the constant increase in the number of wires that are carried in one duct. A few years ago fifty pairs of wires made the unit of underground telephone cable work, and each duct carried only that number of lines. Improvements in telephone cables have been made so persistently that to-day the same duct that formerly accommodated but fifty lines carries four, six and even eight times as many. This great gain in wire capacity has been made without any sensible diminution of the efficiency of the lines, and is consequently a real and sound economy, in no way to be compared with the use of iron or steel wire, which impairs efficiency, or with the overloaded pole line, which constantly threatens a serious interruption to the service.

* * *

We said before that the elements that will aid us in coping with the growing cost of the city telephone message, due to the gradually increasing distance that the city telephone message will have to be carried, will come from both within and without. One of the most powerful elements will be the very point just referred to, the cheapening of underground lines by the increase of the capacity of the duct. Pole line costs will have a tendency to increase rather than to diminish, since the cost both of materials and of labor are more likely to go up than to go down, and with the increase in lines, available routes will become scarcer and rights of way more difficult to obtain and more expensive. But in underground construction great economies have been made in the past few years, and there is doubtless yet room for much more progress in this direction. And since in cities all telephone wire distribution must eventually be entirely underground, or almost entirely so, it is obviously to the cheapening of city underground telephone line construction that we must look for an offset to the increasing amount of wire that the city telephone message will demand.

* * *

Great progress has already been made in this direction, and there is no reason to believe that the march of progress has reached the halting point as regards improvements and economies either in conduit construction or in the cables themselves. That the steps in advance will be either as rapid or as long in the next few years as they have been in the past few years is open to

question. Since underground telephone cables were first extensively used we have progressed from fifty lines a duct to say, three hundred lines a duct, accomplishing a double economy, since not only is the duct used to immensely greater advantage, but the cost per wire of the cable has also been greatly diminished. Therefore we are now able to furnish a mile of underground telephone circuit for very much less than we were a few years ago. And, while the next ten years may not witness such extensive improvements or such large economies as have been effected during the past decade, there is no reason to believe that conduit builders, cable manufacturers or telephone engineers generally are at the end of their tether in the direction of increasing the capacity of the underground duct and diminishing the cost of the underground telephone circuit.

* * *

Therefore, we may confidently expect to accomplish a steady if not rapid diminution in the cost of a mile of underground telephone wire in a city telephone system, and it is certain that we must constantly direct our efforts to the attainment of this end, since it is partly by diminishing the cost per mile of telephone lines that we can afford, without increasing rates or diminishing profits, to furnish a growing number of miles of line for the conveyance of the average message, a condition which we have admitted confronts us. I say it is partly by diminishing the line costs per unit of line that we can offset the growing length of line that each message will demand, because, as already hinted, aid is expected to come from without as well as from within. The aid from without must naturally come in the form of an increase in the traffic per line, resulting in increased productiveness per mile of line. If you diminish your costs per mile of line and increase the daily productiveness of each mile of line you are comfortably able to furnish a growing amount of line for each message without raising the price per message.

* * *

The weak point about the average local subscriber's telephone line is that it is used so little compared to the amount that it can be used. A manufacturing plant is generally worked steadily for a large part of the day, often for the whole twenty-four hours, and during all the time it is at work is earning money, or should be if the business is properly run, wherewith to pay for maintenance, depreciation, interest, and so forth, and for a living profit to the owners. Few manufacturing plants are run for less than eight or ten hours each day, and most are at work earning money for much longer periods out of every twenty-four hours. Consequently, the commercial mind recoils with horror from the idea of running an expensive plant, representing a large investment in perishable machinery, for only a single hour out of each twenty-four. Yet that is the average day's work of the average telephone plant. Indeed, an hour's work a day for the whole plant is a fairly liberal estimate, as the traffic figures for most telephone systems will show. And when we come to consider the case of the individual subscribers' lines we find that there are many in every system that are used but for a few minutes in each day.

* * *

Take the average daily traffic of the average telephone subscriber as being ten calls, which is a liberal estimate, because there are more systems where the average traffic is less than ten calls per subscriber than there are where it exceeds that figure. Allow for each call an average time of three minutes, which also is liberal, for the average local telephone message occupies the plant for rather less than three minutes. Ten calls a day at three minutes per call gives a total daily average use of each line of thirty minutes. Each call, however, occupies two lines, the line of the subscriber originating the message and that of him to whom it is directed, so that each line is in actual use on the average for just one hour out of every twenty-four. In other words, the local telephone system, taken as a whole, is in actual operation, doing service, earning its living, for one twenty-fourth part of each day. The other twenty-three it is standing idle, rusting, growing old, eating its head off, as it were, and running up the accounts for interest, maintenance and depreciation at exactly the same rate as during its one little hour of active work.

The Listening Key.

Opinion and Comment

THE AUTOMATIC EXCHANGE.

EVER since telephone exchanges became a well-established part of current affairs inventors and theorists have spent many efforts and much thought on the interesting problem of making the telephone exchange switchboard a piece of automatic machinery, to be operated by the user of the telephone instead of by an expert operator acting under the instructions of the user. To the inventor and theorist unfamiliar with the practical conditions of the telephone exchange business this problem is a particularly fascinating one. The goal seems most alluring, and it would seem that the prize for the successful solution of the problem should be simply fabulous. To use the slang phrase of the daily papers, do away with the "hello girl" and you save the telephone companies a vast amount of money. The daily papers, in descanting on the virtues of the automatic exchanges that periodically appear on the scene, would further have us believe that in doing away with the "hello girl" the automatic exchange inventor would also save the telephone-using public a vast deal of annoyance. This, like most newspaper views, is a very superficial view of the subject.

The telephone man of experience knows that there is another side to the automatic exchange question, and that this side bristles so freely with reasons why the automatic exchange could not effectively replace the much maligned "hello girl," that he hardly gives the automatic switchboard any serious consideration at all. To begin with, take the purely superficial view of the average newspaper article on the subject—that doing away with the "hello girl" and making the public do its own telephone operating will result in an improved telephone service. Will it? In a previous article we pointed out that the general efficiency and effectiveness of the telephone service would be very much improved if the public did but perform its share of the operating accurately and with a proper regard for speed and for the rights of the "party of the second part." Any telephone man knows that the public does slack work as a telephone operator, even with an expert always at hand to assist, to correct errors, to aid in speed and to supply deficiencies generally. Put the whole operation of the service in the hands of the public, and what sort of a service would the public give itself?

Another point in this same aspect of the subject—that raised by Mr. Abbott in his interesting article on Dr. Faller's highly ingenious mechanical operator—is, Does the public want to be its own operator? In the telephone service the public wants, above all, a quick, sure and efficient service, that shall be operated with as little trouble to the user as possible. If anything goes wrong—and things sometimes go wrong in telephone systems—the telephone user wants some one on the line to tell him what is wrong or to give him some information of some sort. The opportunities for errors of one sort and another would be practically as great in an automatic system as in an ordinary system, and the opportunities for "troubles" would be infinitely greater. And when things go wrong the automatic system gives only a negative signal—that is, no signal at all. If you twist your dial or tap your keys and don't get your correspondent you get nothing. Given the impatience of the average telephone subscriber, how long would he put up with a machine which not only makes him do all the work, but silently mocks him and leaves him in a state of com-

plete doubt and uncertainty when, for any one of a thousand reasons, his work has been ineffective?

For systems of any size the automatic exchange is wholly unsuited, when all the practical considerations that surround the operation of the telephone service are taken into account; and, as Mr. Abbott points out, it is doubtful if it could be shown to effect any substantial economy in operating expenses. Where small self-contained systems, as in factories or other large establishments or even isolated villages, are concerned there should be a good field for the operations of an efficient and cheap automatic switchboard. We intend to follow up Mr. Abbott's excellent article on the Faller system with a series of articles by prominent experts dealing with the other various automatic exchange systems now in existence. From all readers interested in the subject, and especially from those who have had practical experience in the operation of automatic switchboards, we shall be glad to receive opinions and facts bearing on the discussion.

WINNING THE COY SUBSCRIBER

IN his "Reminiscences" recently published, Mr. J. G. Lorraine, the great English Telephone Engineer, touches on one point that will be viewed with interest by telephone men the world over, namely, the winning of the unwilling subscriber. He says:

"Shortly afterwards I acted as consulting engineer in the erection of the Telephone Exchanges in Dundee and Belfast. There was nothing very noteworthy in connection with these exchanges, except perhaps with regard to Belfast, where in order to get subscribers we found it absolutely necessary to give three months' free trial to likely firms. At the end of this period most of them willingly became subscribers, but a small proportion instructed us to remove the instruments from their premises. As we had kept a careful record of their calls we were easily able to tell whether this was intended to squeeze us in the matter of subscription rates; and in case of such parties we delayed removing their instruments but disconnected their lines at the central office. In nearly every instance it turned out that the party having the instruments still before him, and the temptation to use them becoming overpowering, soon subscribed our order form. When this occurred we generally kept him waiting for a sufficient length of time to cultivate his appreciation of the blessings of the telephone conferred on him.

"A noteworthy fact with regard to Belfast subscribers was that we had to supply them with a different form of transmitter from that supplied to our subscribers in Scotland and England. The Blake transmitter, as it was then constructed, was too delicate an instrument for the ordinary North of Ireland voice, so for the Belfast exchange we used the Gower-Bell combination. Most Irishmen emit a stronger current of air in using their voices than do Englishmen or Scotchmen; and in consequence the delicately adjusted diaphragm of the Blake transmitter rattled to such an extent as to interfere with the articulation."

It is evident that the nature of the telephone subscriber has changed but little in the twenty-three years that have elapsed since Mr. Lorrain started to telephone Edinburgh and Belfast, although on the whole telephone customers are hardly so coy as they were in those days. The necessity for supplying the hearty-voiced Irishmen with less sensitive transmitters than those used successfully in England and Scotland is a distinctly delightful touch.

THE TELEPHONE IN WAR

An Interview With
LIEUT. COL. SAMUEL REBER, U. S. A. SIGNAL CORPS.

WHEREVER American troops advance the telephone accompanies them. It moved with the army from Siboney to the trenches in front of Santiago de Cuba. It directed the movements of the cavalry at El Pazo. It was in the center of the American trenches at San Juan Hill. The Porto Rican campaign was marked by a spreading network of telephone lines. In the Philippines, Signal Corps men were ambushed and frequently killed, but the system was steadily pushed ahead and perfected, and the telephone was an indispensable factor in ringing in American sovereignty. One of the most welcome notes to the imperilled legations at Pekin was the call of the hastily constructed military telephone announcing communication with the army and informing the diplomats that messages might be sent out of the Empire, unhindered and on American lines.

Naturally, our flying lines for telephone service on fields of action are hastily strung. Wires are hung to trees, supported on bushes, laid on the bare ground, and sometimes trailed through marshes. For ordinary telegraph work the circuit under such inauspicious conditions would be grounded, but the telephone, be-

During the war with Spain there was a peculiarly significant demonstration of the value of the telephone on the field. In twenty-two minutes from the moment the news of the protocol of peace was flashed from the White House to Porto Rico the proclamation was transmitted by telegraph and telephone to all commanders on the field of action in the island, and two engagements were narrowly averted. Everything had been carefully planned, and the order to begin fire was about to be given. In some instances the telegraph brought the news of peace right to headquarters. But in other cases the telegraph terminus was at least five miles in the rear of active operations. Here the telephone took up the good tidings, and, in a moment, through the ramifications of the system, the commanders on the farthest military line had the news. Thus the telephone had much to do in preventing a needless effusion of blood.

In singular contrast to this are the events that followed the closing of the War of 1812. The Treaty of Ghent was signed on Christmas Eve, 1814, but forty-nine days elapsed before the news could be conveyed to Washington, and in the meantime Jackson,



A TELEPHONE STATION IN THE FIELD.

cause of the delicacy of the receiver and through the use of the buzzer, surmounts these disadvantages. Unless the wire is absolutely submerged we can, through the buzzer device, transmit messages without difficulty. I might explain that the buzzer is simply a coil of low resistance and high self-induction in series with a circuit-breaker, a telegraph key and battery. On opening the circuit the discharge of the coil goes to the line, and, owing to the high self-induction and consequent comparatively high e. m. f., enough current reaches the telephone receiver at the other end of the line to give audible signals.

To have the telephone at the point needed it is frequently necessary to establish stations and maintain them under showers of shrapnel. As the battle proceeds commands are sent and received by telephone, and it is a most valuable adjunct in carrying out the concerted programmes of action. A readjustment of plans of operation can be discussed by telephone, and the instant that a decision is reached details may be telephoned to all commands, even to the extreme outposts.

*An interview with THE AMERICAN TELEPHONE JOURNAL'S Washington correspondent, Harold Bolce, and revised by Col. Reber.

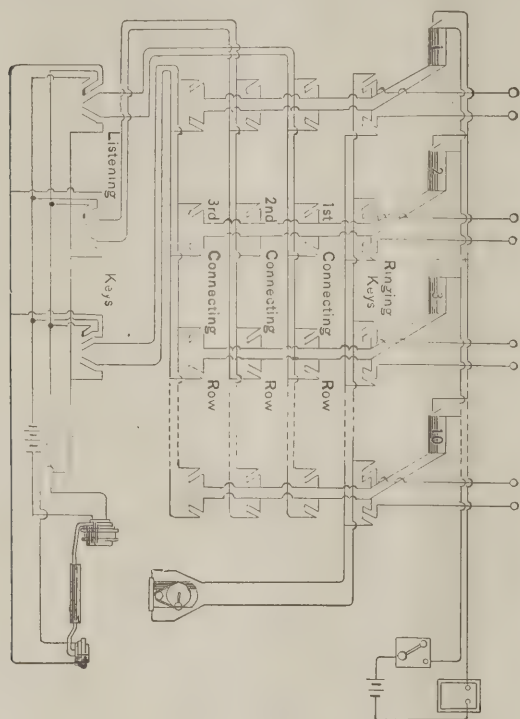
ignorant of the fact that peace had been proclaimed, fought the battle of New Orleans. It took fewer minutes to send the news of peace preliminaries from Washington to Cuba and Porto Rico than it would have taken days in the time of Jackson.

War telephony has become so important a part of our military affairs that the Government finds it necessary to print and circulate special volumes of instructions concerning the construction, maintenance and use of telephone instruments and lines.

Illustrative of the extreme difficulty of constructing wires through a wild country, even when the linemen are not under fire, may be mentioned the operations of the Signal Corps in the Island of Negros, where the condition throughout the Philippine troubles was one of comparative peace. An expedition under Lieutenant Clifton, of the Signal Corps, left the headquarters at Isabella and encountered mountain forests so dense that the trail had to be hewn through the underbrush. Six hours after starting they had blazed their way to an altitude of 2,000 feet. The mountain wall was so steep that the men had to stop frequently to cut steps so that pack animals could proceed.

On the following day a native announced that they had now

reached a point beyond which no man had been able to pass. His ideas of mountain climbing had been made up before he had met Americans. Four days later the Signal Corps engineers entered San Jose, and, through the telephone, called up Isabella and found the line in working order. The mountains along whose sides they had made their way were little less than precipices. The exertions had been so trying that six of the pack animals died of exhaustion.



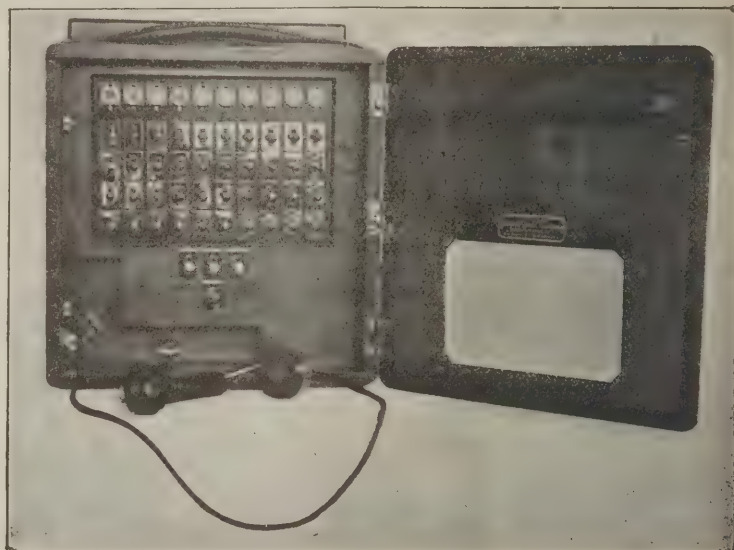
FIELD SWITCHBOARD AND WIRING.

As to the actual dangers of war met and overcome by members of the Signal Corps in constructing wires, the record is brilliant with brave deeds, and, unhappily, tragic with the deaths of many men who have given their lives in the development of this important branch of the service. Travelers to the Philippines now wonder as they witness the telephone service between places separated by seemingly impassable mountains and wildernesses how those lines were ever constructed. And when to the formidable obstacles of the country itself is added the fact that the advance

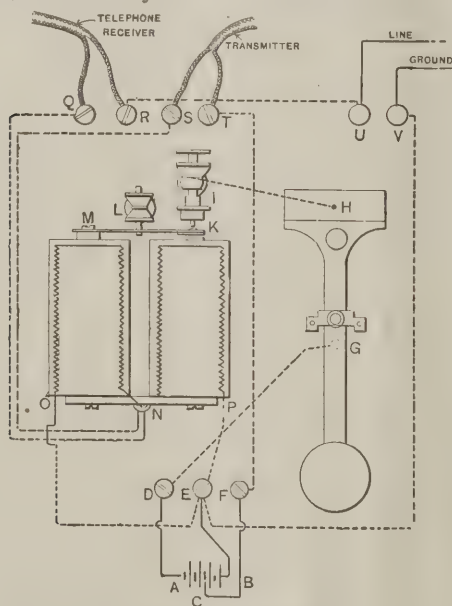
Yet Major-General Wheaton, in prefacing his long list of casualties for 1900, was able to state that communication had been maintained with all stations, which meant that 2,672 miles of telephone and telegraph wire were kept in working order.

Most of the telegraph lines hastily constructed in the emergencies of war are equipped also with telephones, and it is not an infrequent occurrence for telephone messages and telegrams to travel simultaneously on the same wires. There is great advantage in this, for in times of stress, as in the Philippines, it is rarely possible to secure a sufficient number of telegraph operators. Along the Manila-Dagupan line, during the stress of war, many telegraph offices were converted into telephone stations.

In July of 1900 a strategic use of the telephone was witnessed

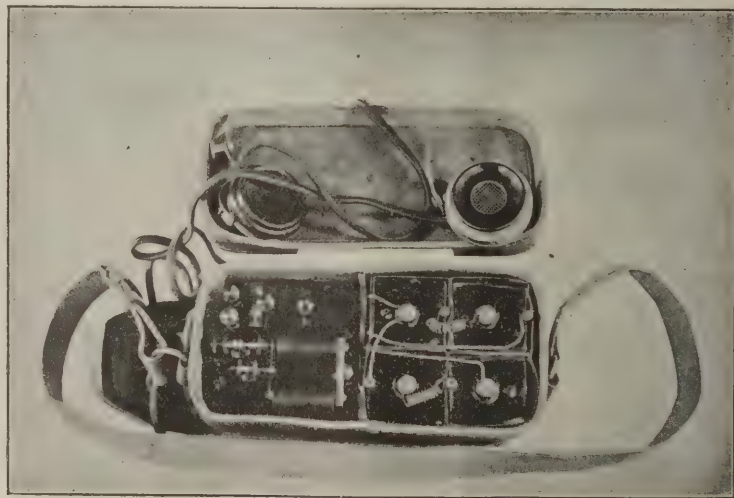


in the Philippines. Many members of the Signal Corps, attempting to repair lines, had been killed by the natives. Finally a corporal named James ventured with a detachment to repair the line near Magdalena. A large force of insurgents lurking in the tall grass surprised the little band of linemen. But Corporal James was equal to the emergency. He had provided himself with a field telephone, by means of which he told the commanding officer at Santa Cruz that the insurgents were upon them. A cavalry detachment was instantly dispatched and was able to surprise the



FIELD SET WIRING.

guards stringing these wires were frequently engaged in desperate conflict with half-savage bolomen, and that these natives, when not attempting to annihilate the members of the Signal Corps, were busily engaged in destroying wires and poles, the wonder grows that telephone and telegraph lines could be built at all.



FIELD TELEPHONE SET.

enemy completely, the Filipinos being driven off the field with heavy losses.

In the advance upon Pekin the work of the American Signal Corps with the telephone was conspicuous. So expeditious were these men that the American forces not only had an independent

and direct line to the coast, but were able to turn over the old field line to the British. No sooner was the military telegraph station established in the Temple of Agriculture than a telephone line was constructed, and the Celestial Capital witnessed the extraordinary spectacle of an American general in a modernly constructed military office in the ancient Temple of the Earth talking by wire with the Minister in the Legation of the United States or calling up an officer stationed at Tientsin or Taku. Between these two cities the British authorities were accorded the privilege of talking over the American wires.

America's lead in this matter of telephoning was the result of the energy and foresight of the Signal Corps. The signal officer in charge had anticipated a lack of poles in China and had ordered 3,000 iron poles to be forwarded. Realizing, moreover, that these might be delayed, he cast about for poles nearer at hand. It was found that there were in Tungchow and Peking many poles, chiefly fir, imported, it was understood, from Puget Sound, and intended by the Chinese for masts for junks, for banner poles, etc. The allies, thoughless of the extreme value of these poles for telephone and telegraph purposes, were converting them into firewood or using them in the construction of barracks. Prompt action on the part of the American signal officer effected the rescue of about 1,000 of these poles, the work of construction was rushed, and before the allies realized really what was taking place American commands were being telegraphed and telephoned between Peking and Tientsin. The Japanese had excellent

carts, pack animals, coolies and a strong corps. They arrived outside the Tartar Gates August 24. The Russians, who had a splendidly equipped telegraph and telephone corps of over 200 men, arrived September 1. On August 17, a week before the arrival of the Japs, American wire had crossed the ancient city walls of the Chinese capital, and messages not only for the Americans, but also for the British, German, Russian, French, Austrian, Italian,

Belgian and Netherlands authorities were being sent to the world, while telephone messages for the expedition of the vast amount of military business were pulsating between the legations and the various military headquarters. Eight box sounders was the original supply of instruments for the American expedition. Three of these got broken in transit. Every telephone intended for use along the line was in need of repair, having been damaged in transportation. The men had been fired upon by Chinese troops. Between Matao and Tungchow they had had a desperate engagement with a force of Boxers.

The telephone in war cannot be wholly disassociated from the telegraph, but inasmuch as the telephone is superimposed generally throughout the system in war movements, and as it is possible to cut in without difficulty on any part of a line and com-



SIGNAL CORPS STRINGING WIRE ACROSS A RIVER UNDER FIRE.

municate by telephone without in the slightest interfering with telegraph messages, the telephone is looked upon as almost indispensable in modern campaigns.

On the battlefield itself the telephone takes its place ahead of the telegraph, for it trails its wires wherever soldiers can march, and not infrequently the ring of its bells is heard in advance of the most intrepid detachments.

TELEPHONE ETIQUETTE

THE disputed question of telephone etiquette that most interests those that make use of the machine has never received any practical solution, although in one office there are already rules as to the treatment of persons who have their office boys call up this particular office. The operator has orders to pay no attention to persons who call up the members of the firm through a third person.

Thus, if Mr. A. has his boy call up the office, and Mr. B. goes to the telephone to find a messenger there and not Mr. A., and is compelled to wait until Mr. A. comes to the wire, he is likely to feel a certain irritation. Widespread as this selfish practice is, there is an active rebellion against it that has resulted in the order made in this particular office that no calls are to be answered when they come from employes—specifically office boys.

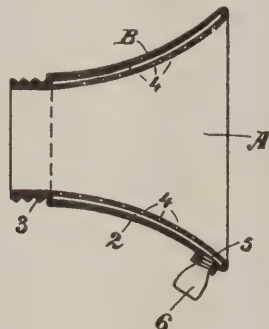
One ruling on this disputed point holds that a third person may call up the office on the telephone, although etiquette requires him to ask in person for the man he wants to talk to.—*The Sun*.

PRACTICAL "WIRELESS" TELEPHONY

A WIRELESS telephone company has been formed in Milwaukee, and gives communication between a window in the third story of the county jail and the third-story window of a house across the street and to the south of the jail. The distance over which messages are sent is over 800 feet. The officers of the new company are: President, Martha Lieke; vice-president, Josie Weiden; secretary, Gertrude Lieke; treasurer, Lizzie Lieke; directors, Julius and Henry Weiden. The line consists of two long pieces of twine which cross the street. One of the lines is for the purpose of ringing a bell at either side, and the other line is the one that does the business. The cord was rubbed with resin before being placed in position, and on each end is a small tin tube with one end open and the other closed with a piece of skin through which the cord is knotted. A voice can be heard across this line as clearly as over an ordinary telephone. The Lieke girls are the daughters of the turnkey of the jail. They call their company the Wireless Telephone Company.

Patents

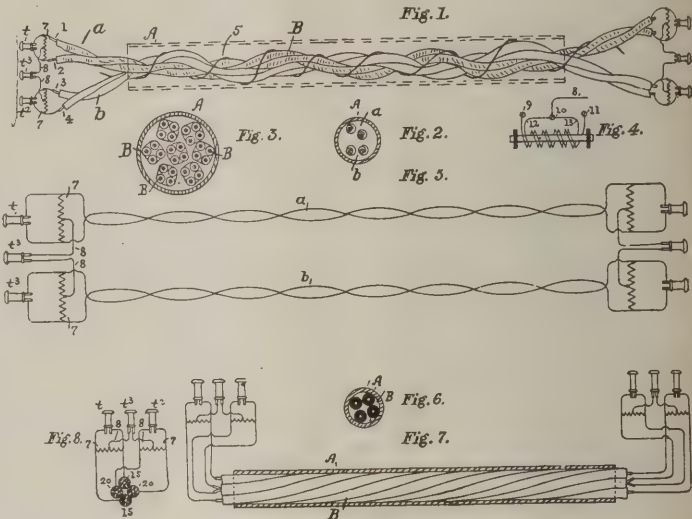
William M. English and George A. Burns, of San Francisco, patent (No. 706,169, August 5, 1902) an antiseptic telephone mouthpiece for transmitters consisting of a mouthpiece made with double concentric sides, with an interspace between them and holes made through the inner portion communicating with the interior of the mouthpiece. Connected with this interspace is a receptacle containing any antiseptic or sterilizing material which will vaporize and fill the interspace between the double sides of the mouthpiece and be discharged through the holes in the filling of the mouthpiece. Referring to the drawing, A is the inner and B the outer mouthpiece, joined at the edges to form the interspace 2. Through A are numerous holes 4, and at the lowest point in B is an opening 5 to which is connected a receptacle 6 so that its



mouth opens directly into the annular chamber 2. The receptacle 6 being filled with some suitable antiseptic or deodorizing substance which is easily vaporized, its mouth being open, is connected with the opening 5, and the vapor or gas arising from the material in the receptacle 6 will pervade the channel or space 2, and, passing through the numerous holes in A, will act to sterilize and destroy any products which may be disposed within the mouthpiece from the breath of the persons using it, so that the danger arising from subsequent use of a mouthpiece will be avoided.

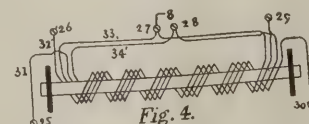
A patent (No. 706,308, August 5, 1902) on a telephone circuit is issued to Marcia J. Farnham, of Wellesley, administratrix of Isaiah H. Farnham, deceased, assignor to the New England Telephone and Telegraph Company. The invention relates to a method of arranging composite circuits by means of which a phantom circuit is obtained from two metallic telephone circuits. The method applies to underground cables. The insulated conductors are twisted in pairs, and then each two pairs are also twisted together in a reverse direction to the conductors forming the single pairs; the length of the twist of each pair and also that of each two pairs is made about three inches. Each set of two pairs when twisted is bound with a thread of some distinctive color for identification, and the whole of the conductors when thus arranged in sets of two twisted pairs are formed into a core in reversed layers. Each two pairs of twisted conductors constitute a unit, which, when the cable is in place, is adapted to form three independent circuits—i. e., the two metallic circuits and a third or phantom circuit in which the conductors of each metallic circuit are employed as one limb or conductor—and in a thirty-pair cable there will be fifteen such units and fifteen phantom circuits. By means of the invention it is possible to greatly increase the circuit capacity of a cable and obtain completely balanced circuits in each of the said units in their relation with one another and in relation to the powerful foreign currents conveyed upon conductors strung in proximity to the cable. Referring to the drawings, Fig. 1 is a diagrammatic view of one unit of the improved cable. Fig. 2 is an end of the same. Fig. 3 is an end view of a cable having a plurality of such units. Fig. 4 is a diagram of the impedance coil used in obtaining the phantom circuit. Fig. 5 is a diagram of circuit connections. Fig. 6 is an end view of a modified cable, and Figs. 7 and 8 are diagrams of the circuit connections of Fig. 6. Fig. 1 shows in a simple way the invention in one unit B composed of two pairs *a* and *b* of paper-

covered conductors in a lead sheath A. Each pair are first twisted together with a right-handed twist, and the two circuits *a* and *b* are then twisted together with a left-handed twist. The twisted unit B is wound with a colored thread 5. The circuits are connected to telephones *t* and *t'*, and between the conductors of each of the two metallic circuits is bridged an impedance coil 7, and from the center 10 of the coil winding wires 8 extend to telephone *t'* to form the phantom circuit, of which pair *a* forms one side and pair *b* the other side. The helices of the impedance coils 7 are wound on in parallel (as shown in Fig. 4) and the outer ends 9



and 11 are connected to binding-posts, while the inner ends 12 and 13 are connected to the bridging-post 10, and the circuit from 9 is from the binding-post 10 by one winding and from said post to 11 by the second winding. In operation the currents from the signaling instruments *t* in, say the circuit *a* circulate through the helices of the coil-winding in series, and have an inductive effect upon the core of the coil, while the currents from the signaling instruments *t'* circulate by the connecting branch 8 to the centre of the helices of the coil and thence through the said helices differentially to the circuits *a* and *b*, and have no inductive effect upon the cores. The coils are thus wound so that a perfect balance is obtained between the two metallic circuits *a* and *b* and the third or phantom circuit *c*.

Martin H. Howell, of Melrose, Mass., patents (No. 706,319, August 5, 1902) and assigns to the New England Telephone and Telegraph Company a telephone-circuit in which an improvement is made on the foregoing invention by the adoption of a novel form of repeating coil in place of the impedance coil shown in the circuit devised by Mr. Farnham. The repeating-coils consist, essentially, of two separate windings upon a soft-iron core. The helices of one winding are in series from one terminal to the other and are inductive to alternating currents circulating through the second winding of the coil, and the helices are provided with two end terminals and also with a third central terminal. The helices of the second winding are provided with two end terminals and with a third central terminal, and the helices are inductive to alternating currents entering or circulating from an end terminal and continuing through the helices in series, but are non-inductive to currents which enter the central terminal, divide, and pass to the terminals at either end of said winding. Referring to the drawings, Figs. 4, 8, 10 and 11 are repeating coils embodying the invention, Figs. 5 and 6 show applications of it, Fig. 6 illustrates a shorter line joined to a longer line subject to



inductive disturbance from a power circuit H, the inventor claiming that the coil is particularly effective in preventing any audible inductive effects from such a condition. Fig. 4 shows a repeating coil I which is very effective in operation when used as illustrated in Figs. 5 and 6, and exercises no retarding effect to the passage of telephone currents entering at split or point 27, where the phantom circuit is introduced. The helices of the coil consist of four conductors, 31, 34, 32 and 33, which are preferably twisted together, and their right-hand ends are respectively brought to the screw-

posts 28, 30, 27 and 29, and the left-hand ends are brought to the screw-posts 25, 28, 26 and 27, respectively, so that each conductor passes through the coil in two windings in series with one another, the points 27 and 28 being in the centre of each of the two windings. Both sides of the coil are balanced and are symmetrical. The extension or conductor 8 from the point 27 on the side N of the coils I at each end of each circuit connects with the telephone t^2 , and the conductors of the circuit a terminate at the screw-posts

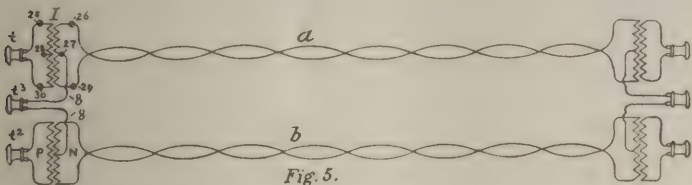


Fig. 5.

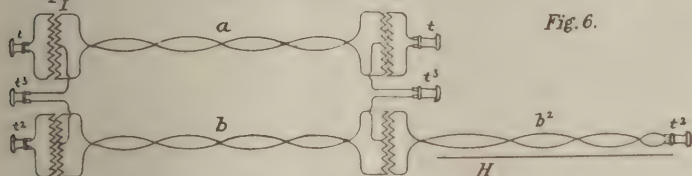


Fig. 6.

26 and 29, respectively, and the terminals of the local telephone circuit are secured in the screw-posts 25 and 30 of the side P of the coils, so that the circuit a is one side and the circuit b the second side of a phantom circuit having the instruments t^2 at each terminal. In the operation of the phantom circuit current passes from the telephone t^2 , to 27 of winding N of one of the coils I associated with the circuits a and b —say a —where it divides, a portion going through the helices of the coils in opposite directions, coming out at the points 26 and 29, and then continues over the conductors of the circuit to the corresponding points 26 and 29

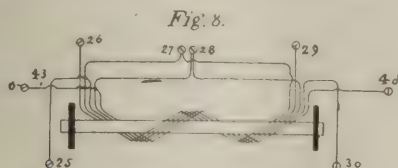


Fig. 8.

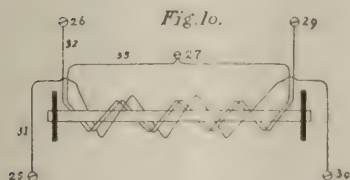


Fig. 10.

of the winding N of the coil I at the opposite end of the circuit and traversing the helices in opposite directions comes to the point 27 and to the telephones t^2 , from which it continues by a similar route to that just described over the circuit b to the home end of the circuit. As the current splits at the point 27 and goes in opposite directions through the helices, as described, one side neutralizes the other, and therefore no inductive effect is produced in the core, and consequently there is no disturbance in the telephone t or t^2 at either end of the circuits, and when the telephone t or t^2 is used the generated currents enter the P winding of the coils I and traverse the same in series, and an inductive effect is produced in the core, and similar currents are induced in the N winding of the coil which circulate in the helices thereof in series and are propagated over the conductors 1 and 2 of the circuit and pass through the helices of the winding N of the coil I at the opposite end of the circuit and are inductively transferred to the winding P, through whose helices they circulate in series and are received by the telephone in the local circuit of the winding. Fig. 8 shows a coil similar to that in Fig. 4, having a third winding which provides an escape for static charges on the line. Fig. 10 shows a coil in which the two wires 32 and 33 are twisted together before they are wound on the bobbin (but for the sake of clearness are not so represented in the drawing), and the single wire 31 is then wound over them.

Martin H. Howell, of Melrose, Mass., patents (No. 706,318, August 5, 1902) a composite electric circuit in which the special form of repeating coil covered in the previous patent is employed to obtain phantom telegraph and telephone circuits from

metallic circuit telephone lines. The patentee claims that the invention has special adaptation for transmitting market quotations of various sorts to adjacent towns and cities from a central source, as a plurality of telephone toll-lines extending between said towns and cities may be utilized and be made to serve as telegraph circuits.

Fig. 1 illustrates two metallic telephone circuits whose con-

Fig. 1.

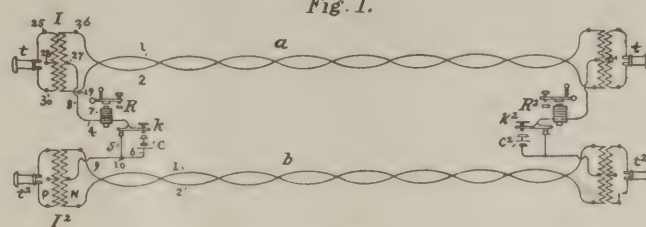


Fig. 3.

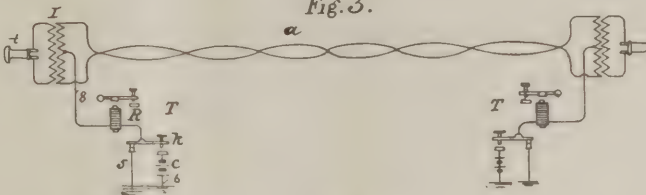
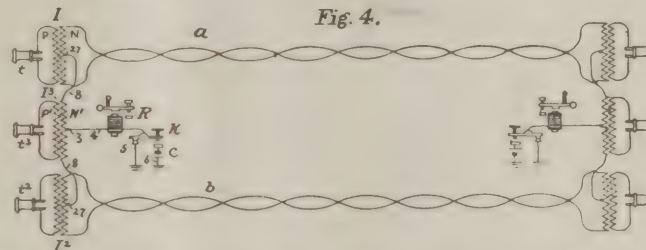


Fig. 4.



ductors, by means of the special repeating-coil, are employed for a metallic circuit telegraph line. Fig. 3 is a diagram of a metallic circuit telephone line that is used as one side of an earthed telegraph line. Fig. 4 is a diagram of two metallic telephone circuits from which is arranged a phantom telephone circuit and also a phantom telegraph circuit which employs the two metallic

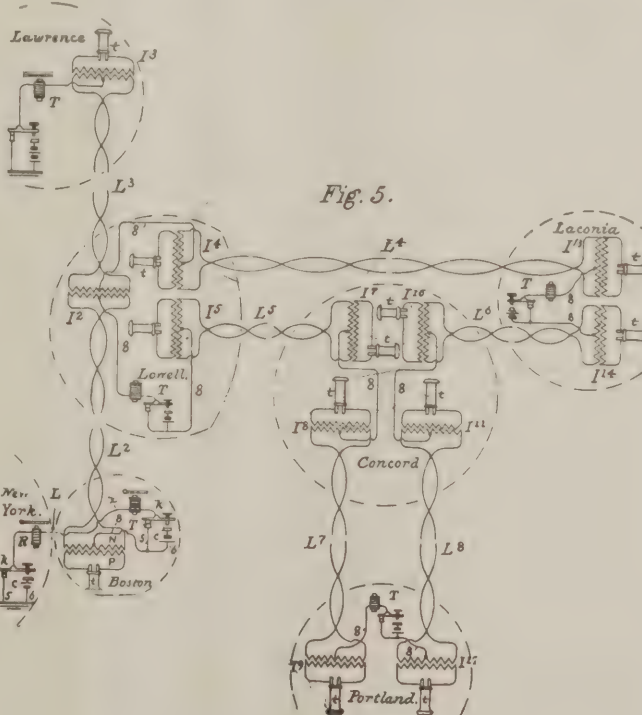


Fig. 5.

telephone circuits as one side and the earth as the other side of the circuit. Fig. 5 is a diagram showing several telephone circuits and the utilization of the same as a distributing telegraph circuit. In all cases the repeating coil used is the same as that described in the previous patent, and with the description of that patent the accompanying diagrams explain themselves.



New Companies

BORDEN, IND.—The Overland Telephone Company, of Borden and Henryville, has been incorporated with a capital stock of \$1,000.

CRISMAN, IND.—The Portage Home Telephone Company, of Crisman, has been incorporated, with a capital stock of \$10,000. Directors: H. D. Schofield, Claus Brink, E. G. Miller and others.

SPICELAND, IND.—The Spiceland Co-operative Telephone Company has been incorporated, with a capital stock of \$10,000.

GRAVEL SWITCH, KY.—Articles of incorporation have been filed by the Rolling Fork Telephone Company. The incorporators are B. T. Calhoun, R. L. Overstreet, W. F. Powers, Henry M. Pittman and J. A. Holton. The company has a capital stock of \$200 and proposes to build a line from Gravel Switch to Forkland and to Junction City. A line will probably be run to Danville and other points in Boyle and Mercer counties.

DETROIT, MICH.—A long-distance telephone company, to operate in connection with the Co-operative Telephone Company, has been organized here, with a capital stock of \$25,000 and 10 per cent paid in. Articles of association have been filed. Arthur A. Cowles is president; Jasper C. Gates, vice-president; J. Carl Danziger, secretary; C. M. Burton, treasurer. D. Walter Bell, of Wheeling, W. Va., who is interesting himself in getting subscriptions in the east for the Co-operative Company, has taken 100 shares in the long-distance company, which is to be known as the Peninsular Telephone Company. C. M. Burton says that the switchboard the Co-operative Company has contracted for will have 200 long-distance lines, as many as will ever be needed, and that as soon as the switchboard is up the wholesale merchants of Detroit will have the chance to talk with 800 Michigan towns from which they are now barred because they have no telephone communication with them. He says that Northville or Pontiac will be the first town with which the Peninsular Company will have connection.

PARK RAPIDS, MINN.—The Citizens' Telephone Company, of Park Rapids, has been incorporated with 10,000 capital stock. L. H. Rice, L. W. Bills, T. C. Myers, F. C. Rice and P. D. Winship are the directors.

SPRINGFIELD, MO.—The Home Telephone Company, of Springfield, has been organized, with a capital stock of \$100,000. The incorporators are H. B. McDaniel, B. W. Redfearn, C. O. Trask, F. C. Curren, A. J. Eisenmayer and W. D. Tatlow, of this city, and J. B. Ware, of Detroit, Mich.

LINCOLN, NEB.—Articles of incorporation for the Republican Valley Telephone Company have been filed with the Secretary of State. The authorized capital stock is \$5,000, and the incorporators J. B. McGrew, W. Hildreth, I. E. Montgomery, George W. Green and Perry Hildreth.

CHATHAM, N. Y.—The Chatham and Canaan Co-operative Telephone Company was recently formed to construct a telephone line from Chatham to Canaan Four Corners, a distance of nearly fifteen miles, touching at Red Rock, Frisbee Street, Pleasant Valley and Canaan Center. The line will be constructed at once. The officers are as follows: President, A. B. Howes; vice-president, Frederick C. Goodrich; secretary, Austin H. Ford; treasurer, Alexander Bartlett.

NORTH LEWISBURG, O.—The North Lewisburg Telephone Company has been incorporated, with a capital stock of \$6,000.

OAKWOOD, O.—The citizens of Brown and Auglaize townships are endeavoring to make arrangements for a telephone line from Oakwood to Defiance, via Arthur and Englewood. Herman Schroeder and Lem Reams have the matter in hand, and expect to get 30 or 35 telephones along the line. The idea is to have a central at Oakwood, and connect with the central at Defiance.

WHITEWRIGHT, TEX.—The Whitewright Telephone Company, of Whitewright, Grayson County, has been incorporated, with a capital stock of \$10,000, for the construction and operation of lines of telephone in and through the counties of Fannin, Grayson, Collin and Hunt. Incorporators: W. C. Fain, R. May and Lille Selph.

Financial

INDIANAPOLIS, IND.—The telephone companies have been assessed \$6,157,091 for taxes by the State Tax Board. This is an increase over 1901 of \$1,720,428.

Elections

LINDEN, IND.—The stockholders of the Tippecanoe Telephone Company at their annual meeting elected the following directors: J. M. Waugh, Colfax; H. C. Shobe, Linden; M. P. Gladden, Stockwell; C. E. Campbell, Lafayette, and Dr. A. D. Pyke, of Romney. The following officers were elected: H. C. Shobe, president; M. P. Gladden, vice-president; C. E. Campbell, secretary; Dr. A. D. Pike, general manager and treasurer; J. W. Coffey, superintendent.

BEAVER DAMS, N. Y.—The Schuyler County Telephone Association held a meeting recently to elect four directors. They expect to commence the line from Beaver Dams to Watkins in the near future.

Franchises

COVINA, CAL.—J. D. Reed and J. O. Houser, who applied for a telephone franchise here recently, were the only bidders at the sale of a franchise. They bid \$60, but as that sum did not cover the expense of granting the franchise, they raised their bid to \$72.50, at which figure it was sold.

PEKIN, ILL.—The Citizens' Telephone Company of Pekin has been granted a 15-year franchise by the village board of East Peoria. G. H. Glass, the Pekin manager, was present, and addressed the board as to the work to be done. A line will be built from Pekin to East Peoria, and from there connections will be made with Lacon and other Independent lines to the eastward of the village.

ST. CLOUD, MINN.—At a recent meeting of the city council, an ordinance was presented by the Minnesota Rural Telephone Company giving permission to enter the city from the east. The company is a Princeton concern, with a traffic agreement with the Twin City Company, and desires to gridiron Benson and Mille Lacs counties. Action on the application was postponed.

OMAHA, NEB.—More than 600 voters have signed a petition to the council asking that the initiative and referendum be recognized, and that a proposition to grant the South Omaha Independent Telephone Company a franchise be submitted to a vote of the people. It is the desire of those interested to have at least 1,000 signatures to the petition before it is presented to the council.

MOUNT VERNON, S. DAK.—A local company has been granted a franchise by the town board to erect a telephone exchange in Mount Vernon. Work will soon commence on the enterprise, and the managers expect to have it in running order within a couple of months.

Competition

CONE, IOWA.—The Cone Telephone Company, recently incorporated, is making preparations for the installation of a complete telephone plant to compete with the Iowa Telephone Company, which has had a monopoly here. The central office and exchange will be located here, with lines radiating a distance of seven or eight miles in all directions. All subscribers of the Cone Telephone Company will have free communication to Muscatine, and the new line will connect with the Mississippi Valley Company in Columbus Junction.

PITTSFIELD, MASS.—The Berkshire Telephone Company, which has applied for rights in this city, will receive its franchise. This will give the rival to the Bell telephone the first stand in Western Massachusetts. The new company promises conduits for the business streets, free telephones for city offices and many other inducements.

MARSHALL, MICH.—The Independent telephone system, which was started at Marshall as a result of the Bell company's raise in rates, is nearly ready for operation. It has 350 subscribers.

PEEKSKILL, N. Y.—A movement is on foot here to organize an Independent telephone company. It is said the Hudson River Telephone Company is conducting its service on such an economical plan that when a subscriber is called up the response comes back from central that some one else is on the wire. This is not satisfactory, and local capitalists think better results can be had from a home company.

YOUNGSTOWN, O.—The Youngstown Retail Grocers' Association has unanimously decided to discontinue the use of the Central Union Telephone

THE WEEK'S MESSAGES *Continued*

Company's telephones in favor of those of the Youngstown company. The committee which had the matter under consideration went thoroughly into all the details, and decided that between the two propositions there was but one choice.

Combinations

TUCKAHOE, KY.—The Dover, Minerva, Tuckahoe and Maysville telephone line has been sold to W. L. Holton, of Tuckahoe.

HUME, MO.—The defunct telephone line of Ross & Rose, which has been tied up in the courts several months pending the settlement of creditors' claims, has been purchased by E. M. Dickinson and M. L. Beadles. They will put the service into operation at once. They will also put in the fifty telephones they have on hand in town. After which they will run a line to Stotesbury, one to Rich Hill and one to Foster, supplying the contiguous territory with connections.

VANDALIA, MO.—The Lacrosse Lumber Company, of Louisiana, Mo., has bought the Vandalia telephone system, paying \$3,000. It will be made a part of the Buffum system, which extends all over this part of the State.

ELLCOTTVILLE, N. Y.—George E. DeGolia, of Salamanca, who recently purchased the Belmont Telephone Company's property and business, has bought the Ellicottville telephone system and will extend a line to Great Valley and Humphrey. He will also run a line to Ashford and Devereaux, and another to Mansfield, with Ellicottville for the central.

WARWICK, N. Y.—The directors of the Warwick Valley Telephone Company and Henry Greenfield and C. H. Tuthill, of the Highland Telephone Company, have agreed to purchase jointly the telephone line of Conkling & Strong, which runs between Warwick, Bellvale, Greenwood Lake and Monroe. This line was built by I. W. Litchfield, B. B. Sayer and M. N. Kane in 1890, who incorporated under the name of Intervale Telegraph and Telephone Company. Several years later the line was sold to Conkling & Strong, who used it for telephoning between their places of business in Monroe and Warwick.

MARTINSBURG, W. VA.—The Winchester Telephone Company, which was recently absorbed by the United Telephone Company, of Philadelphia, has transferred its stock and equipment to the new concern. Manager Hoover, who will continue to manage the local plant, says that important improvements will be made to the line and its efficiency greatly strengthened just as soon as possible. While the C. & P. Company was stronger than the individual Winchester company, Mr. Hoover added, and could, therefore, put up a great fight, the chances now, since the United company has absorbed the local line, are that the C. & P. cannot do much, as the United is stronger financially than the C. & P.

Construction

MYSTIC, CONN.—George D. Johnson, superintendent of the Mystic telephone exchange, is extending the service.

BRAZIL, IND.—The new Independent Telephone Company is erecting poles for its new system over the city.

MOLINE, IND.—A gang of men is at work for the Union Electric Telephone Company erecting the distributing poles on the outskirts of the city, and they will soon commence laying conduits in the fire limits.

OSKALOOSA, IA.—Another long distance telephone line has been connected with the Oskaloosa exchange of the Home Telephone Company. The new line is the property of the Coper Long Distance Telephone Company, headquarters at Grinnell. It gives connection with Grinnell and Marshalltown, Cedar Rapids, Muscatine and Davenport, and all intermediate points. The Oskaloosa office of the Home Telephone Company is very busy installing rural lines. Two hundred and seventy rural connections have been contracted for, and only two hundred and forty of these have been put in.

ROCK ISLAND, IA.—The Union Electric Telephone and Telegraph Company has let the contract for the construction of its new exchange here. The building must be in condition to be fitted out with switchboards by October 1, and must be completed by the first of November. It will be constructed of pressed brick, with stone foundations and stone columns in front, and will cost \$12,000.

FLEMINGSBURG, KY.—The Flemingsburg Telephone Company will in a short time put in a 200-line switchboard, and will also build a full metallic trunk line to Maysville.

PEMBROKE, ME.—The work of putting up the Independent telephone line between Pembroke and Charlotte to connect with the line from Calais is progressing finely.

SUNDERLAND, MASS.—The Sunderland Telephone Company, having gained the required permission from the town officers, is setting up poles. It is quite probable that the line will be extended to North Sunderland.

TRAVERSE CITY, MICH.—With the completion of the improvements now being made by the Citizens Telephone Company, Manager C. W. Wheelock says Traverse City will have one of the finest equipped tele-

phone exchanges in the State of Michigan. The range of outside territory will soon be largely increased, as men are at Sherman and will arrive here soon with a pair of No. 10 copper wires, which will bring the Traverse City subscribers in touch with Ohio and Indiana points and give communication with Toledo, and with Detroit as soon as the Co-operative Telephone Company in that city installs the exchange. "It looks now," says Manager Wheelock, "as if Traverse City will have communication this year by Independent telephone lines with Chicago. Up to a short time ago I thought it would be years before we would enter that city. Word comes from South Bend, Ind., that a line may be run to Chicago this year. Our annual report for the fiscal year ending June 30 shows that we gained 300 subscribers in Traverse City last year. We now have nearly 800 subscribers in this exchange."

KENSINGTON, MINN.—The line crew of the Holmes City-Alexandria Telephone line has reached Kensington. The wire is now strung all the way.

KEARNEY, NEB.—The Farmers' Home Telephone Company, of Shelton, has purchased a switchboard to accommodate 100 telephones, 100 feet of cable and fifty new telephones. The Gibbon Home Telephone Company has been organized with stock sufficient to build a line to Buda, and expects to begin work on the line in the near future, and is building several short lines into the country. The Home Telephone Company, of Kearney, will build from Buda to this city, and the system between Shelton and Kearney will be for all general purposes the same as one Independent system, although the ownership will be vested in three separate corporations.

NEBRASKA CITY, NEB.—The Nebraska City Telephone Company's construction gang will begin work stretching the big cable that they have had on hand for some time soon. The men are at work finishing up the rebuilding of the Syracuse exchange at present.

TOBIAS, NEB.—The Saline County Telephone Company is putting in telephones here.

HOPKINTON, N. H.—The Hopkinton Telephone Company is extending its lines toward the Tyler District.

ALBANY, N. Y.—The Home Telephone Company is preparing to construct a telephone system here. This company is also constructing a system in Kansas City, Mo., and has plants in operation in several other cities.

JORDANVILLE, N. Y.—The Herkimer County Telephone Company is extending its line to Jordanville and has several miles completed.

ONEONTA, N. Y.—The Oneonta Telephone Company has completed a double copper circuit to West Oneonta, where it has made connections with the Morris line, and now has exclusive service with the latter and intermediate places. The recently organized Davis Telephone Company, which is to operate in Delaware, Otsego, Schoharie, Schenectady and Albany counties, will also connect with the Oneonta Company.

ROME, N. Y.—The poles for the extension of the Rome Home Telephone line connections from Vernon through Vernon Center to Knoxboro are set, and the cross arms are being placed in position. The line will be carried on to Oriskany Falls as fast as possible, the material for its construction being on the ground ready for use.

WATERLOO, N. Y.—The Home Telephone Company is progressing with the construction of its line in this village.

WOODHULL, N. Y.—An Independent telephone line is being constructed between Woodhull and Troupsburg.

NECHE, N. D.—The telephone line from Neche to Walhalla, a distance of twenty-two miles, is about half completed. The system will unite the postoffices of Hyde Park, Leroy, Boy Center, Ernest and Walhalla with the main line to Grafton.

DEVILS LAKE, N. D.—C. E. Burgess, president of the North Dakota Long Distance Telephone Company, with headquarters at Aneta, is arranging for a station here for his line. The company is already operating in some of the smaller towns in this section, and has its poles placed as far as Petersburg, in Nelson county. It hopes to complete a circuit of at least 150 miles before fall, and will connect this city with Fargo, Grand Forks, Minot and all intermediate points by means of another private system which is being constructed.

ALBION, O.—At a recent meeting of the Albion Telephone Company it was decided to extend the lines of the company to Keepville and Cherry Hill.

DARBY, PA.—The Keystone State Telegraph and Telephone Company has almost completed the erection of its lines in this county from Darby to Marcus Hook. All the boroughs between and including these points have been poled and wired, and there is only six miles of line remaining to be constructed. The new company will give unlimited long distance service to its subscribers in the numerous boroughs and townships. At present the Keystone Company will not make any attempt to enter Chester. The extension of its system in this city will be a matter for future consideration.

JOHNSTOWN, PA.—The Johnstown Telephone Company is putting in a new line to Cresson. The work will be completed shortly.

THE WEEK'S MESSAGES *Concluded*

PARSONS, PA.—The People's Telephone Company is placing poles in position for the new lines, and telephones will soon be installed.

ARTESIAN, S. D.—The new rural telephone line between this place and Woonsocket is rapidly nearing completion, and farmers along the line already are being benefited by the convenience.

EUREKA, S. D.—The Telephone Company is making many improvements in its service. A new line is being constructed from Eureka to Artas on the Soo, thence to Zeeland on the Milwaukee, then Venturia and Ashley on the Soo. A line will be run from Artas west, connecting with Herreid and Pollock on the Soo. From Pollock north to Stafford and Linton on the Milwaukee. Later a connection will be made with Braddock and Bismarck.

PARKER, S. D.—Material has been ordered for a new farmers' telephone line to be constructed between Parker and Hurley. It will start off with about twenty subscribers, and this number will be steadily increased.

LULING, TEX.—Dr. W. D. Branyon, of Prairie Lea, is building a telephone line from Fentress to Luling, and will install a number of telephones here soon. This line will connect with the Lone Star Company's lines at San Marcos, and will have connection with all the important places in the State.

LEESBURG, VA.—The Herndon & Leesburg Telephone Company will build and maintain a line from Leesburg to Dranesville, and the Northern Virginia Telephone Company will build one from Dranesville to Falls Church. The Northern Virginia Company will have charge of the business in the town of Leesburg. Several gangs of men are now at work constructing the line. M. E. Church has made a proposition to the Snickersville Telephone Company to operate in connection with their local system a long distance line from Bluemont to Leesburg and intermediate points, thereby giving to Bluemont, Round Hill, Purcellville, Hamilton and Paconian Springs the benefit of long distance connections. But his proposition not being accepted, he is now preparing to build a line from Leesburg to Bluemont.

GLENWOOD, WIS.—Thomas Brockley has his telephone system in process of construction. The line will extend from Boyceville to New Richmond, passing through this city and villages of Downing, Emerald, Ceylon and Jewetts Mills.

Miscellaneous

JEFFERSON, IA.—The incorporators and stockholders of the new telephone exchange have taken definite action toward building the new system. Five thousand seven hundred dollars has been subscribed in stock. A. Harris, who will have charge of the construction, is already receiving estimates on poles, and will order them at once. Wire and telephones will soon follow, and in a little while the people will be receiving telephone service at about half the present rates, together with first class service.

BOSTON, MASS.—The instrument statement of the American Telephone and Telegraph Company for the month ending July 20 shows gross output of 59,935 instruments, an increase of 3,409 over 1901; returned, 34,054, an increase of 3,813; net output, 25,881, a decrease of 404. For the seven months, from December 21, 1901, gross output was 649,044 instruments, an increase of 112,205, and net 301,639, an increase of 87,084. Total instruments outstanding are 2,914,735, an increase of 660,280 over last year.

SAVANNAH, MO.—The Andrew County Mutual Telephone Company has purchased the central of the Farmers' lines at Bolckow and has wire and poles on hand for erecting the several toll lines. The switchboard connections at Rosendale have been purchased of Mr. O. M. DeLay for \$125, and it is the intention to keep the central where it is now. Permission has been secured to place brackets on the Farmers' line from Savannah to Rosendale and put up a toll line, which will become the property of the Mutual. The work on this line is already under way.

ELMIRA, N. Y.—The Century Telephone Company, the long line company which is trying to work its way east from Cleveland, O., has just succeeded in getting past this city after a delay in securing the right of way.

AMELIA, O.—The Citizens' Telephone Company has opened its exchange at Amelia with over forty subscribers, and the management expects to materially increase the number within the near future. W. H. Baum, the general manager of the Citizens for this county, says they now have over 700 subscribers in the county. A connection has recently been made with the Warren county system at Cozaddale, which puts Clermont county patrons in touch with all points in Warren county at a slight additional charge. Mr. Baum states that they expect soon to be able to make such connections as will give Clermont subscribers access to every quarter of the State. The Citizens now have in Ohio over 100,000 subscribers, and their business extends into nearly every county.

HETLAND, S. D.—The new telephone system at this place has been placed in operation. It starts off with a large number of subscribers and promises to have a rapid growth. A branch line has been extended into the country for the convenience of the farmers.

GLOUCESTER, VA.—The Board of Directors of the Tidewater Telephone Company met here recently. The superintendent reported that the

long delayed work on the Mathews lines was progressing well, and that the exchange at Mathews courthouse could soon be opened. Maynard Street, who is in charge of the construction work, was elected manager of the new exchange. Mathews county will be under his management. A committee was appointed to confer with the upper Rappahannock Telephone and Telegraph Company with reference to connection with that company at Rappahannock.

Personal

CANON CITY, COL.—Austin L. Hatch has been appointed manager of the telephone exchanges in Canon City, Florence and Westcliffe.

EATON, O.—Reese Lockwood, who has resigned his position as electrician with the Eaton Telephone Company, has accepted a similar one with the Home Telephone Company, of Charleston, W. Va.

TRADE NOTES

THE KELLOGG SWITCHBOARD AND SUPPLY COMPANY, Chicago, has received a contract from the Peoples' Telephone Company, of Jackson, Mich., for a complete new switchboard equipment for its rural telephones. The Peoples' Company is at present installing a Kellogg switchboard in Jackson.

THE AMERICAN ELECTRIC TELEPHONE COMPANY, Chicago, has shipped to the Corinth Co-Operative Telephone Company, of Corinth, Vt., 39 high-grade telephones, 18 for Royalton, 11 for South Royalton, 5 for Barre City, 6 for Bradford, and 1 for Chelsea, and 4 switches also shipped to Bradford, together with other supplies, among them being a dozen extension bells.

PLANTS FOR SALE

TELEPHONE PLANT FOR SALE—160 telephones, 100 miles of toll lines; excellent opportunity for extending business; will sell for \$12,000; pays 15 per cent. net on this amount. Address **TELEPHONE CO.**, care of **AMERICAN TELEPHONE JOURNAL**.

FOR SALE.—\$20,000 will buy a first-class, remunerative Western toll line; part payment only, cash; good reasons for selling. Address **G. R.**, care **AMERICAN TELEPHONE JOURNAL**.

WANTED

WANTED.—Position as manager of exchange of 100 or 200 subscribers; or as inspector or traveling salesman for supply house. Eight years' experience; best of references furnished. Address **G.**, Box 125, Monroe, Ga.

WANTED.—A good transfer boy to take care of 125 city and 130 country telephones. State lowest wages and experience. Address **VIRGIL A. GEIGER**, Churubusco, Ind.

SUPERINTENDENT of construction company, position as superintendent or manager of exchange of 1,500 subscribers or more; gilt edge references furnished. Address **SUPERINTENDENT**, **AMERICAN TELEPHONE JOURNAL**.

POSITION with Electrical or Telephone Manufacturing Company, by an expert battery-maker Twenty-two years old; good references furnished. **THOS A. LOUGHRAN, JR.**, 28 Romaine Avenue, Jersey City, N. J.

WANTED.—Position as wire chief or manager of an exchange of 1,500 or 2,000 subscribers in a clean Western town or city by a married man of temperate habits, with twelve years experience with the Bell Co., but now taking care of an exchange district with 1,500 subscribers for an Independent Co. Can give good references. Address **L. M.**, **AMERICAN TELEPHONE JOURNAL**.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address **F. BISSELL CO.**, Toledo, Ohio.

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TEST OF DRY CELLS FOR TELEPHONE WORK

BY RAY H. MANSON

THE best test of dry cells for telephone work is that which they are subjected to in every day service at the subscriber's station. In such a test the actual results as to durability and lasting qualities, as well as the maintenance of the station, can be easily determined. But in order to make a quick test and at the same time to keep accurate record of the performance of the cells it is necessary to resort to laboratory methods.

Within the last few years the telephone transmitter has been greatly improved; the best instruments for local battery work are now constructed with a resistance of approximately twenty ohms and will give the highest efficiency of transmission with about three volts pressure in the primary circuit. It is not practicable to let the pressure of a local battery fall below one and one-half volts, this reading to be taken at the terminals of the cells with the circuit closed through the transmitter.

Thus two cells, each giving about 1.5 volts, connected in series will give enough pressure to supply the requisite amount of current for efficient transmission, and the useful life of the cells will be passed when this pressure becomes about one-half its original value.

A number of dry cells of different makes were submitted to a comparative test, and as it was not practicable to allow the test to extend over the required length of time to determine the actual "telephone life" of the cells, the following method was adopted:

Two cells of four different makes were connected in series and arranged in a discharge and testing circuit, as shown in Fig. 1. The discharge circuit for each pair of cells consisted of a resistance coil of 20 ohms, which represented the transmitter resistance, and a pair of normally open relay contacts. The operating current for the relays was regulated by a clockwork switching mechanism which closed the circuit of a 24-volt storage battery through all of the relays for a period of six minutes, three times during each hour. Thus the cells were discharged for six minutes and were allowed 14 minutes recuperation between the discharges, this cycle being kept up continuously during the entire period of the test, which lasted for 60 days.

Ammeter and voltmeter leads were brought out to spring jacks "a" and "v," so that the testing instruments could be easily connected to the different circuits by means of plugs and cords, as shown in Fig. 1.

Simultaneous readings of milli-ammeter and voltmeter were taken every morning for each set of cells. As the circuit resistance remained quite constant, it was found necessary to plot only the voltmeter readings in order to compare results and derive conclusions. The curves for all of the batteries of the same make showed practically the same characteristics, so results from only one set of each of the four makes of cells are shown plotted in Fig. 2. The first reading of each curve was taken on open circuit, and the remainder of the readings were taken with the circuit closed through the 20-ohm resistance coil. In the case of batteries "C" and "D" it was found necessary to wait fully one minute before the closed circuit voltage fell to a constant value.

It will be noticed from the curves that the battery "D" had the highest open-circuit voltage at the beginning of the test, 3.18 volts, and at the end of 20 days this pressure had fallen to slightly less than one volt, closed-circuit reading. This result, taken in connection with the curve of the battery "A," which started with an open-circuit pressure of 2.88 volts and at the end of the test still remained above 1.5 volts, closed-circuit reading, would tend to give the impression that the make of battery having, when new, a low open-circuit voltage would give the best

results. But, contrary to these results, battery "B" started with an open-circuit voltage of 3.06, and came out a good second in the test, so we may safely assume that it would be impossible to determine the life of a dry cell from its initial open-circuit voltage.

In order to determine mathematically the "telephone life" of the different batteries from the results of this test, we will assume for a load factor 8 telephone calls per day of two and one-

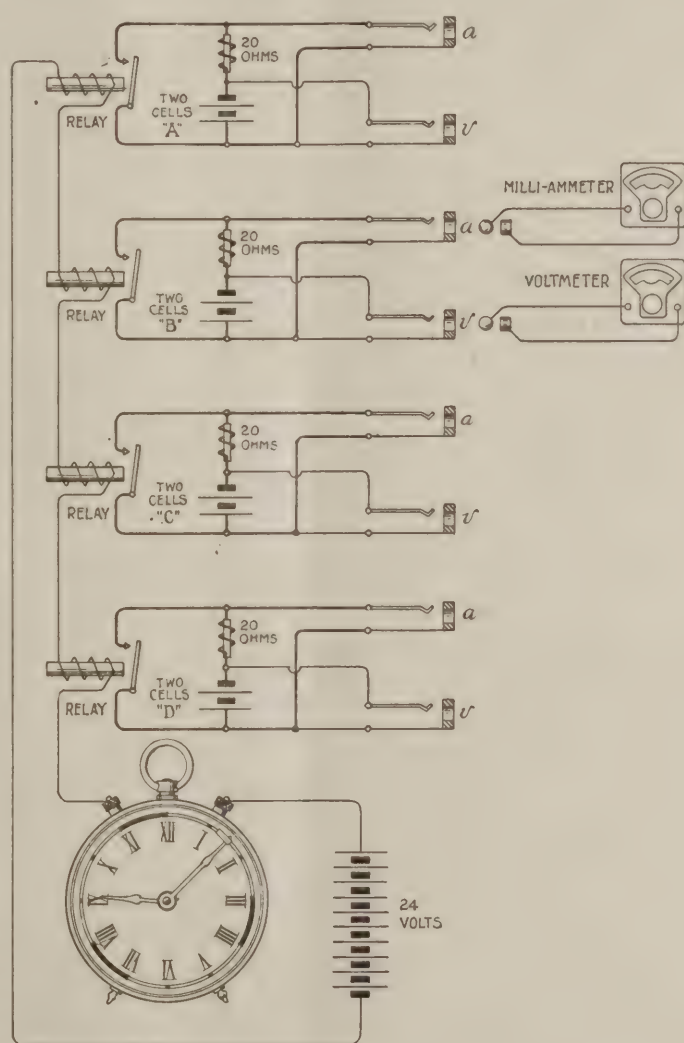


Fig. 1

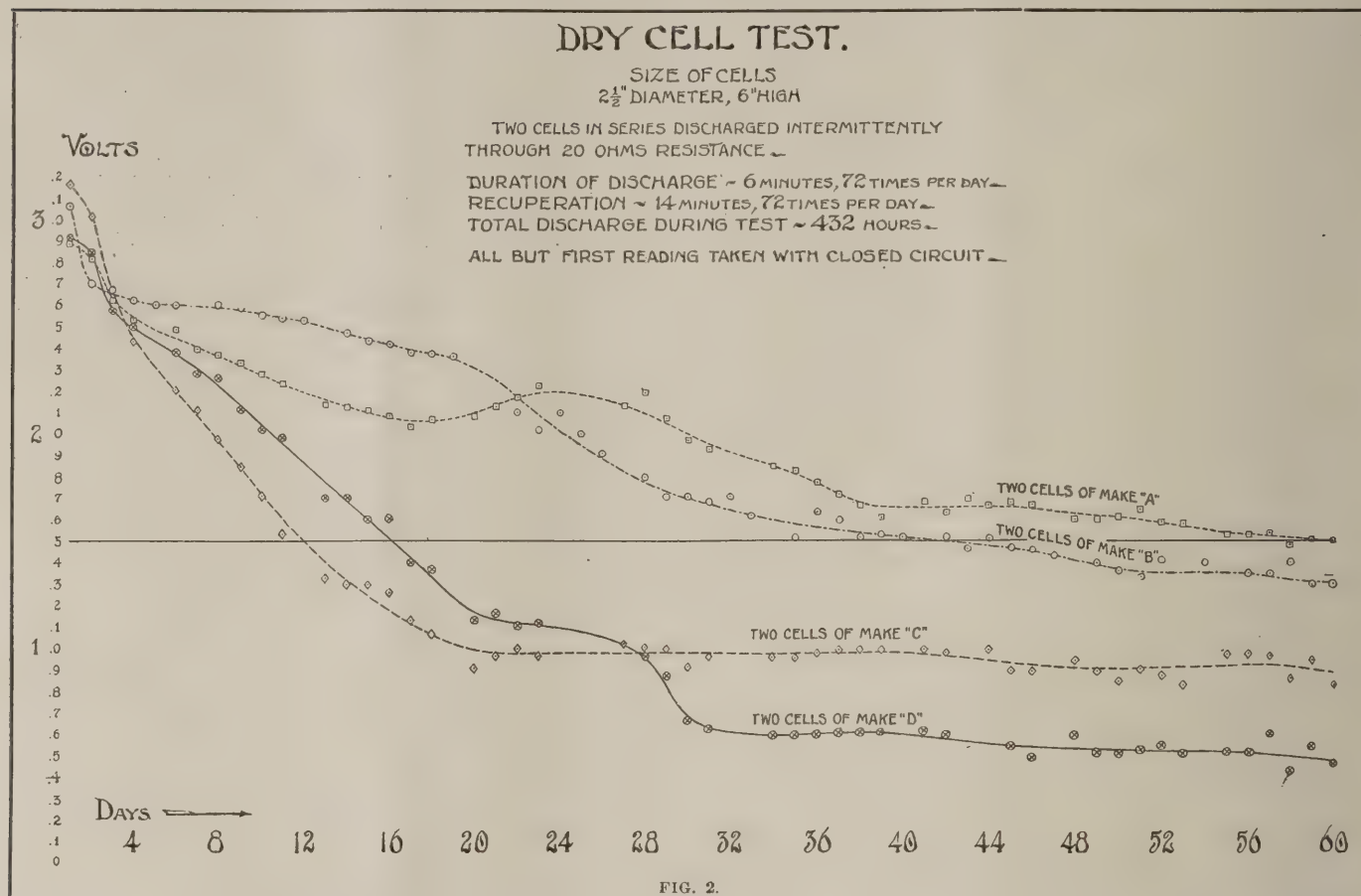
half minutes duration each. This gives 20 conversation minutes per day. With one and one-half volts as the lowest limit allowed for local battery pressure, we find in the case of battery "A" that its curve is above this limit at the end of the test, which represents 25,920 minutes of actual discharge. The actual discharge in minutes, divided by the number of conversation minutes per day, gives for the "telephone life" of battery "A" 1,296 days, or 3.55 years.

In like manner the curve of battery "B" crosses the lowest limit of useful voltage at the end of 42 days, or 18,144 minutes of actual discharge. This gives for the "telephone life" of the two cells of make "B" 907 days, or 2.48 years.

Computing the "telephone life" of batteries "C" and "D" in the

Make "D" battery .71 years "telephone life."

The actual telephone life of the above cells would in all probability be considerably less than the computed figures although the 60 days' test was very severe, with no long interval for complete recuperation such as would occur in actual service.



same way, and tabulating the results for comparison, we have the following:

Make "A" battery 3.55 years "telephone life."

Make "B" battery 2.48 years "telephone life."

Make "C" battery .94 years "telephone life."

The local action would of course depend on the care in construction and on the quality of materials used. The curves of batteries "A" and "B" show not only a better quality of material, but more careful design for quick recuperation than those of batteries "C" and "D."

THE TELEGRAPHONE

BY JOSEPH B. BAKER

AMONG the scientific novelties that made the Paris Exposition of 1900 such a striking index of western civilization was the first model of the telegraphone, the invention of a Danish electrical engineer, Waldemar Poulsen by name. The telegraphone is a brand-new machine for reproducing sound, and it does this in a brand-new way. More than this, it records words spoken at a great distance from the machine; indeed, as far as the telephone can carry, whereby it justifies its brand-new name. Let us consider the operation of the machine first, however, in its capacity as a recorder and reproducer of sounds—in which capacity it is more than likely to become a formidable competitor of the now familiar phonograph.

Although this machine is the child of a European inventor's brain, it owes its wonderful capabilities and its special future usefulness—indeed, its possibility of being what it is—to the American invention of the telephone. It is interesting to note that Mr. Poulsen has long been a successful worker in the field of detail telephone apparatus, and that such work prepared his abilities for the brilliant achievement that now comes to us from the "capital of Denmark." American tourists at the Paris fair, fresh though they might be from the electric, hustling atmosphere of this country, were obliged to draw a long breath of admiration and give ungrudging praise to the creator of the machine in which a sliver of steel is made to "talk back" from the end of an ordinary telephone line. For, in recording the voice, for example, one does not speak to the machine itself, but to a telephone that is connected to the machine by wires which may be but a

few feet or may be hundreds of miles in length. At first glance the machine, as now made by one of the great German electrical manufacturers who are pushing American establishments so hard in the race, resembles very much the tinfoil Edison phonograph that astonished many of us years ago. One notices the same cylindrical drum, which Mr. Poulsen turns upon its shaft by an electric motor, and the same carriage moving slowly along the drum as the latter rotates; but here the resemblance ceases. Examination shows that the drum, which is of brass, has wound upon it a length of thin steel piano wire, and that the "carriage" supports not a vibrating diaphragm and recording stylus as in the case of Edison's phonograph, but a tiny electro-magnet not much larger than a lady's thimble, with its poles presented toward but not touching the steel wire. The coils of the electro-magnet are connected to a telephone into which the sounds to be recorded are uttered, or else to the line at the distant end of which the telephone is connected.

The operation of the telegraphone—it bears also the names "microphonograph" and "magnetophonograph"—is as wonderfully simple as it is scientifically beautiful. Perhaps the most remarkable feature of its operation is the fact that there is no direct material contact between the recording mechanism and the steel wire upon which is so mysteriously traced the "record," as it would be called in phonograph parlance. You remember the schooldays' experiment of moving a magnet along underneath a piece of paper sprinkled with iron filings, and how the filings arranged themselves in serried ranks, in beautiful curved lines

that followed every approach of the magnet. The like is what really takes place here, only that we have hard steel in place of soft iron, and the visible marshalling of the filings is replaced by unseen but powerful pushings and haulings in the very inmost fibres of the moving steel. Upon starting the machine and talking into the telephone, what happens is the invisible, but absolutely faithful molecular alteration of the steel wire passing beneath the magnet, whereby every sound vibration in succession, characteristically distinguished as it is from the vibrations which precede and follow it in its qualities of pitch, loudness and timbre, is recorded in the steel by the varying strength of the electro-magnet that is receiving a true electrical copy of the sounds uttered. One might express the action of recording the sounds by saying that there is produced in the wire, by their electro-magnetic effect upon it, a long series of minute magnet poles that remain fixed, each in its proper place and of its proper strength, and each ready to give back in these same relations the sound which originated it. The spoken words are implanted in the steel, though nothing has touched it; there is no change in its appearance, no trace of the magnetic waves that have beaten upon it. All sounds that the electric wire can carry are capable of leaving their faithful impress upon the steel. Suppose it is an orchestra whose strains at a telephone two hundred miles away it is wished to record. Start up the machine again with a fresh length of wire upon it, and watch the tiny recording magnet do its work in silence, carving an invisible symphony in the very inmost substance of the steel and forcing the ultimate molecules, by their obedience to physical law, to arrange themselves in serried ranks; a mighty army manoeuvring each individual to its own place upon this machine in Boston in response to the conductor's baton in New York.

The reproducing of the recorded sounds is accomplished by the agency of one of those remarkable "reversible" phenomena of which the practical applications of electricity offer so many instances. If you take a dynamo, ordinarily driven by a steam engine belted to its pulley, and connect wires to it leading from another source of electric power, the dynamo becomes an electric engine delivering mechanical power at the same pulley that just now was receiving it. The reproduction of sound in the telegraphophone is so nearly just this action as to warrant the comparison. For if we set the machine going again, starting the little electro-magnet to follow once more the turns of steel wire—a telephone receiver being connected this time in the circuit instead of the transmitter—we shall have reorganized an electric circuit wherein the dynamo has become a motor; the magnetism distributed along the steel by the mechanical power in the original sound vibrations acts now, through the intermediary of the little traveling magnet, to move the diaphragm of the telephone receiver. In other words, the vibrations frozen in the sliver of steel, spring to life again when the operation of the machine is electrically reversed, with a result far more wonderful than Munchausen tells us of in the story of the bugle that was hung by the fire to thaw!

The phonograph of to-day, with its fragile wax cylinder and big brass horn, is familiar to eye and ear. Many of us have been disappointed that Edison's achievement has not taken a more prominent place in practical affairs, instead of having by far its principal use as a versatile musical instrument and scientific toy, with almost no place in the business affairs of life. This thought leads us to a comparison with the new device, the telegraphophone, that may serve to enlighten us as to its future possibilities.

It has been explained that in the telegraphophone the moving magnet which serves in turn as "recorder" and "reproducer" does its work without actual contact with the wire on which is impressed the "record." This should mean a great diminution

of the scratchiness and other acoustic disagreeables that accompany the use of the phonograph with its stylus in direct contact with the wax surface of its "record." Further, the fact that the operation of the telegraphophone is purely electro-magnetic means a comparatively very pleasing fidelity to every shade of the original utterance, together with a clearness and freedom from extraneous noises that leave little to be desired.

The method of obliterating an old record and at the same time preparing the steel for a new one is simplicity itself. Whereas, the wax cylinder of the phonograph is "shaved" by passing it under a knife that removes the sound-indented surface, in the telegraphophone the steel record is merely passed beneath a magnet connected with a source of steady current. This operation wipes out the magnetic irregularities that the formerly recorded sound waves had left in the steel, leaving it "blank" for the reception of the next utterance to the connected telephone.

Right here it should be said that as great loudness of reproduction has not yet been attained with the telegraphophone as with the phonograph, the durability of the telegraphophone record however, is comparatively very great; instead of a wax cylinder with a very susceptible surface, easily damaged by a breath or a finger touch, we have the length of tough steel wire—or ribbon, such as Mr. Poulsen prefers in some forms of his machine—that can be removed from the machine, coiled up and sent to a distant place, suffer all the ordinary battering and banging about in the mail, and still be ready to be wound upon another machine, and give up its message unimpaired. The wire record has even been allowed to rust, only to be found still in possession of its secret, and ready to give it up after being cleaned with sandpaper. The record in ribbon form has been wound into a tight roll not unlike the paper tape upon the reel of a "stock ticker," and has been found to be unaffected by such close proximity of the turns, each with its portion of the magnetically written sound. A very striking advantage of the telegraphophone is that the records may be indefinitely long; instead of listening to but one cylinder-full at a time, as with the phonograph, one may keep his receiving telephone to the ear while as many miles of ribbon as he pleases are passed through the machine! No doubt in the future operas, sermons, novels, and what-not, according to the listener's choice, will be available to be heard uninterruptedly at one sitting. This feature, important as it is, is perhaps destined to be of secondary moment compared to the use of the telegraphophone in conjunction with the immense telephone systems actually installed. It will be remembered that the use of the telephone, from the very start, made its way by leaps and bounds, to the rapid exclusion of the telegraph for local communications, and the telephone even deprived of almost every practical application the ingenious writing telegraph, or "telautograph," of Prof. Gray. To-day the telephone is with us by the hundreds of thousands—the number stamped upon the instrument at the writer's elbow is one of seven figures—because it had a quality of convenience and gave a celerity to the despatch of business that could not wait for even an electrically moved pen. But now that we can attach to our telephone a simple instrument that will take down a verbal message given in our absence! Well, "Wonders will never cease!" one class will exclaim. "A remarkable invention, with electricity still in its infancy," will be a saying echoed by thousands.

A healthy infant, truly; a giant "infant." Dear old Dr. Franklin it was that said, in reply to some impertinent questioner of the practical "use" of drawing sparks from a key hitched to the clouds, or of this new electricity anyway, "What is the use of a baby!"

KANSAS ASSOCIATION CONVENTION POSTPONED

It has been deemed advisable to postpone the date of meeting of the Kansas Independent Telephone Association's Convention to September 11 and 12, and it will be held at Kansas City, Mo. The convention was scheduled for this week at Topeka, Kan., but in order to perfect arrangements—such as railroad rates, complete a programme, etc.—it was found necessary to change the date of assembling. Kansas City has been selected for the meeting place in view of a very cordial invitation, which has been extended by Messrs. Barber & Brailley, of the Kansas City Home Telephone Company. Independent telephone men all over the State of Kansas are deeply interested in the success

of the Home company's plant at Kansas City, and it is thought much good will come of the holding of the convention at that place. An invitation has also been extended by the association to all Independent interests of Western Missouri, especially in territory contiguous to Kansas City, and the meeting will be of double interest on this account. Fully eighty per cent. of the Independent interests of Kansas have signified their intention of attending the convention, and this, together with a large number expected from Missouri, will make the meeting a truly representative body, not only in point of size, but also on account of the wide interests that will be represented.

FOREIGN CURRENTS

THE Italian Government has presented to the Italian House of Representatives a projected law authorizing the construction of a general long-distance telephone system to serve all the large towns and the principal rural districts of the kingdom. This system of lines is to be completed in eight years, which seems a reasonable period, and is estimated to cost \$1,160,000, which seems a reasonable sum. During the first four years there will be built fifty-three main lines, with their various spurs and branches, and during the second four years twenty main lines, each with its proper branches and feeders, are to be built. The proposed law will enable outlying villages to be connected by telephone with the nearest telephonic centre, and the telephone and telegraph services will thus be put within reach of many localities in Italy at present deprived of them. The law also grants to telephone subscribers the right to send telegrams by telephone. If the work of building the new system were to be done in one year instead of in eight perhaps some American contractors might be tempted to make a bid for it, but no American telephone man, we imagine, wants to settle down in Italy for the sake of \$150,000 worth of work a year.

* * *

The most recent statement of the Italian Government Post and Telegraph Department states that the experience so far had with the few long-distance lines built since 1898 confirms the opinion that the public use of the telephone is growing rapidly and that it is necessary to cater to this demand by developing the system. Concessions have been granted lately for numerous urban and interurban networks. The statement shows that the Italian Government had fifty-nine telephone systems in operation, with a total of about 7,500 stations. It is interesting to note that everywhere that the telephone is spoken of there is the same tale of more or less rapid development and urgent public demand for greater facilities for telephonic communication.

* * *

Long-distance telephony spreads slowly in Europe, largely because those controlling it also control the telegraphs and are chiefly interested in guarding the telegraph revenues from the competition of the telephone, while the long-distance telephone largely creates its own business, by making it possible to do that which was impossible before; still it is a strong competitor of the telegraph and, undoubtedly, takes much business that would otherwise go over the telegraph lines. For that matter it is also a competitor of the railways and hotels, since it often enables a business man to avoid a long trip that would be necessary if he could not have a personal interview with another in some distant place by telephone. The most important long-distance line in Europe for many years was that between London and Paris, only some 350 miles long, but containing twenty odd miles of cable across the English Channel. The London-Paris line has been used exclusively between the two capitals, giving no connection with other places and almost exclusively for stock exchange and press business. An agreement has just been made between the British and French post-offices whereby London will be connected to 300 of the principal commercial towns in France. It is somewhat of a surprise to know that there are 300 principal commercial towns in France, and still more surprising that they should all want to talk to London, or London to them; but it is expected in this way to make the Anglo-French telephone lines of more general utility and not let the stock brokers and reporters monopolize their advantages. The service will be available only to subscribers to the Government telephone systems of the two countries.

* * *

The long-distance service between Belgium and France is also being extended, and it is projected shortly to put Brussels and Charleroi in communication with Paris and Marseilles. Brussels and Paris have long had telephonic communication; in fact, this line was the first real long-distance telephone line in Europe and was the first long line on which the Van Rysselberghe system of simultaneous telephony and telegraphy was practically used. As with the London-Paris line, the Brussels-Paris service is used only between the two terminal cities, and mainly for stock-exchange business. The extension from Paris to Marseilles is a long one and carries the line from the edge of the North Sea to the shores of the Mediterranean. The line from Charleroi

to Marseilles will be among the longest in Europe, the distance being about 1,200 kilometers, or 720 miles. The representative of a big concern in Omaha the other day published a statement to the effect that for years it had been the practice of his company to hold a daily conversation with the company's agent in Boston, over a line 1,540 miles long. What would they say in Paris and Brussels, one wonders, to a telephone line nearly 2,500 kilometers long! That would carry them, as far as the distance goes, not merely from Charleroi to Marseilles, but across to Algiers, on the opposite side of the Mediterranean.

* * *

Some interesting results have been published of tests on a new type of telephone cable with distributed inductance, manufactured in Germany by the Rheidt Cable Works. A cable was made of 28 pairs of conductors, of which seven are of 2 millimeters (.078 inches) diameter and the rest of 1.5 millimeters (.059 inches). To increase the inductance, the conductors of each pair were separated from each other as much as possible; some of the conductors were made of iron and copper strands twisted together. The results of some of the measurements are given as follows: The resistance of the bimetallic conductors of iron and copper of 1.5 millimeters was found to be constant for alternating currents, of frequencies ranging from 330 to 900, the inductance measuring .000422 henry and the electrostatic capacity .0644 microfarad per kilometer, equal to about .00067 henry and .103 microfarad per mile. The measurements of the iron-copper conductors of 2 millimeters diameter gave .00041 henry and .0852 microfarad per kilometer, equivalent to .00065 henry and 1.363 microfarad per mile; while the all-copper wires of the same diameter gave .000296 henry and .087 microfarad per kilometer, equivalent to .00053 henry and .147 microfarad per mile. As might be expected with a cable built in this manner, tests made on different lengths of cable gave somewhat varying results. Using carefully selected telephone instruments satisfactory talking was obtained over a length of 96 kilometers (59.52 miles) of the cable. The makers of the cable consider that the introduction of inductances in the manner described above is a decided improvement in the construction of telephone cables.

* * *

Many American daily papers recently published glowing accounts of the system of wireless telegraph and telephony, said to have been invented in England by Messrs. Armstrong & Orling. The following note from *Electrical Investments* shows that in expert circles the Armstrong-Orling announcements are taken with a grain of salt even in their native land:

"The names of Messrs. Armstrong and Orling have recently appeared in the all-embracing *Daily Mail* and the hospitable *Westminster Gazette* in connection with the old familiar sort of announcements of wireless telephones, etc., that are 'going to be.' We should not be at all surprised to find written above the Armstrong-Orling office in Moorgate street the lines:

'Hope springs eternal in the human breast
Man never is, but always to be, blest.'

"When is Mr. Armstrong going to give that lecture at the Royal Institution, and when is he going to give a real chance of inspection of his marvels to men who know the difference between a telephone and a typewriter? With a sense of relief we learn that the co-inventors are not coming to the public for capital. But why the office in the city and the diligent wooing of the poor innocent daily press? Mr. Marconi is not the only wireless wonder from whom explanations are demanded."

The Arrester.

THE URBANA TELEPHONE COMPANY

THE Urbana Telephone Company, of Urbana, O., which recently increased its authorized capital stock from \$50,000 to \$100,000, has used the new capital for taking care of the business in the city and on the lines already established. This company now has nearly 1,200 telephones connected, 800 of which are in the city of Urbana, the others being installed on farm lines in the surrounding territory. The growth of this plant has been most remarkable. It is regarded among Independent people as one of the most successful of any in the Ohio field, and probably is not surpassed by any other plant of like opportunities in the country.

IN THE OPERATING FIELD

TOLL-LINE CONSTRUCTION IN NEW YORK

A TOLL line service between Ithaca and Auburn, Ithaca and Watkins and Ithaca and Cortland, embracing the intermediate points, is to be constructed at once. Plans for the three lines have already been completed.

A telephone system which will operate in conjunction with the Ithaca Telephone Company's service and with the toll line will furnish communication to the residents of the townships through which the toll line extends. Two separate systems will be constructed in this way.

The toll line from Ithaca to Cortland will have stations in Etna, Freeville and McLean. A branch line will extend into West Dryden. Running on the poles of the toll line will be several pairs of wires to connect the homes of farmers with the Ithaca and Cortland exchanges. All the farm houses within a reasonable distance of the route of the toll line can have telephones.

The toll line between Ithaca and Watkins will have stations at Glenwood, Jacksonville, Trumansburg, Taughannock Falls, Willow Creek, Reynoldsville, Bennettsburg, Smith Valley, Burdett and Mecklenburg. A farmers' line will also be built along this route and its branches.

The line from Ithaca to Auburn will run to Forest Home and Groton, and there connect with the Farm and Village telephone service owned by Rudolph Miller. It will extend through North Lansing and all intermediate points to Auburn.

RAILWAY TELEPHONE INSTALLED

THE Canada Atlantic Railway will soon have completed a private metallic circuit telephone line between Ottawa, Can., and Depot Harbor. The system will be one of the most complete and up-to-date private systems possessed by any company. In its construction, covering a distance of 262 miles and return, about 534 miles of copper wire have been strung. Cross-arms have been placed on the telegraph poles and splendid progress is being made with the work. Part of the contract was awarded to an electrical company, while the company is carrying out the remainder under the direction of Mr. LaBrie. A small switchboard has been placed in the central station in Ottawa, where the private exchange will be located. Besides the connections at Madawaska and with the elevator and terminals at Depot Harbor, there will be half a dozen other connections with the head offices in the Central chambers and the various freight sheds. The object of inaugurating such a service is to relieve the telegraph lines and afford better communication with the elevators of the company with which there is much detailed business transacted. For some time the company has had a private telephone system of about twenty instruments in the yards, the central office being in the premises occupied by Mr. R. S. Richardson, yard master. The new telephone line to Depot Harbor will now give the company the best facilities in communication. To install the system complete means an expenditure of about \$8,000.

COMPETITION IN MUSCATINE, IA.

THE Mississippi Valley Telephone Company is making many improvements to its exchange at Muscatine, Ia., which will bring its service up to the first class.

Competition in Muscatine is particularly strong. The Bell Company has recently reduced its rates to \$26 for business houses and \$1 a year for residences, and has exerted itself to get farmer subscribers. It has met with very poor success in this notwithstanding its ridiculous reduction for residences.

The Mississippi Valley, on the other hand, has 125 new contracts for rural telephones, which it will bring into its exchange as soon as the repairs are completed.

At Wapello, Ia., where the Mississippi also operates an exchange, it is meeting with the same gratifying success. The Bell Company's subscription list has been brought down to just 15 subscribers. The Mississippi Valley, on the other hand, is gaining ground every day. It now has 135 city subscribers and 150 in the rural districts. New contracts are being added daily, and it has 25 city subscribers waiting for installation at the present time.

FRANCHISE TACTICS OF THE BELL

RECENTLY a telephone company was incorporated in New York styled the "Grand Island Telephone Company."

Frederick H. Williams is president and Josiah Jewett, Jr., treasurer; directors, these officers and Josiah P. Wright, Francis J. Rixey, J. Boardman Scovell and John V. Bedell. The purpose of the company was to establish communication between Grand Island and the mainland. The promoters of the scheme took the members of the town board to a good dinner, and then got a franchise absolutely unconditional and unrestricted.

Now it has developed that this company is backed by the Bell company and is really a sub-license of that company. This is shown by a mortgage, which was filed August 12 in Buffalo. It is given by the Grand Island Telephone Company to the Bell Telephone Company, and is for \$2,500 and covers all property that the Grand Island Company has, including its franchise and all other corporate rights. The mortgage is given as security for an advance of \$2,500, made by the Bell company, which, as the document announces, is to be used in installing and maintaining a telephone system on the island to connect with the Bell system on the mainland. The mortgage is for five years and contains a condition that upon default of payment of any installment of the interest, the mortgagee (the Bell company) may declare the whole principal due and foreclose.

When the certificate of incorporation was filed no mention was made of the Bell company. That was reserved until after a franchise was secured. Now that a franchise has been granted, the Bell company comes boldly to the front with this mortgage, which is really nothing more or less than a selling out.

INDEPENDENT TELEPHONES FOR TOLEDO

BELL telephones in Toledo, O., now have a competitor, and one that is going to prove very dangerous. Last week

The Toledo Home Telephone Company gave its first service to subscribers. It started business with over 2,000 telephones connected. There was no hitch to mar the opening, everything moving along smoothly and in perfect order. All week the staff of the Home Company has been busy connecting the remaining subscribers, and within a week or ten days it is confidently expected that the entire 6,000 telephones will be in use.

The new exchange building of the company has been completed and the offices are now being fitted up, as are also the parlors, reading rooms and dining rooms of the operators.

The long-distance service will not be in working order before the last of the month. Arrangements have been made with two Independent long-distance lines—the United States and the Northwestern. The United States Company is putting in a station now, and will later connect with the Home company.

CELEBRATES SECOND ANNIVERSARY

FRIDAY, August 15, the Churubusco Telephone Company, operating in Churubusco, Ind., was just two years old. It celebrated its second anniversary on that date with a subscription list of over 250 telephones in actual operation. Of this number, 140 are installed in farm houses in contiguous territory to the Churubusco exchange. The farmers appear to be more awake to the benefits derived from telephones than do the citizens of the city. The Churubusco company is now contracting for materials for a new exchange building, which will be completed early next year. When this is done it will install a new switchboard of the latest pattern, making its system strictly up to date in every particular. Wm. A. Geiger and Virgil A. Geiger are the owners of this prosperous little plant.

GROWTH OF A SMALL COMPANY

THE success of the Fort Recovery Telephone Company, of Fort Recovery, O., which was organized just one year ago, has been very remarkable. The company has grown on all sides, having at the present time over 100 local subscribers, and about 50 line subscribers. The company has in operation about 65 miles of metallic circuit and seven miles of single-grounded line. The company uses the central energy system, and has recently installed a switchboard with a capacity for 350 subscribers.

Opinion and Comment

RELAYING TELEPHONIC CURRENTS

SINCE long-distance telephony was first tried and found to be good telephone engineers and inventors have striven in vain to produce a practical telephonic relay. The problem is quite different from that of the telegraph relay or translator. A telephone relay to be of any real value must work both ways equally well, must reinforce the voice-currents of each speaker on a line, and must be capable of working continuously without any need for adjustment or attention. Given the difficulty of these conditions and the well-known delicacy of telephonic currents, it is small wonder that the problem remains insoluble and that the telephonic relay remains the philosopher's stone of telephony. The Patent Office records no doubt illustrate and describe telephone relays without number, but working telephone lines are guiltless of any one of them.

Practical experience and scientific investigation both go to show that the range of distance at which telephone conversation may be carried on may be increased, not by the adoption of special relaying apparatus, but by a special treatment of the line. The use of copper instead of iron, the adoption of metallic circuits instead of grounded, the transposition of circuits, the efforts to obtain a low capacity are all steps in the treatment of the line which have increased the range of the telephone. Now we are in an epoch of more radical and far-reaching methods, based on scientific research into the phenomena of alternating currents. Professor Pupin has shown that theoretically the range of the telephone may be increased almost indefinitely by the use of distortionless circuits, has explained what a distortionless circuit is and how it may be obtained. The process is no simple one, and since no accounts have been published of the progress made in the practical application of the Pupin method of treating telephone circuits we know not whether practical results bear out those obtained on paper and in laboratory experiments.

A highly interesting patent, issued to Mr. Joseph Lyons, of Washington, which we publish in full this week on account of its interest to telephone men, bears on this same subject—the special treatment of the line to obtain improved telephonic effects. Mr. Lyons applies to telephonic currents an effect discovered some time ago by two French electricians, which is that a faint alternating current can be reinforced by including in the circuit an alternator specially designed in relation to the frequency of the current to be reinforced. Whether this ingenious idea will find a workable and practical application in telephony is somewhat open to doubt, both by reason of the wide variation in the frequency of voice currents and by reason of the probability of noise being introduced on the line by the reinforcing machines; but in any case it is a highly interesting invention and will well repay study by telephone men.

THE TELEGRAPHONE

WE print this week a somewhat enthusiastic article by Mr. Joseph B. Baker on the telegraphone, the beautiful invention of Waldemar Poulsen, the Danish telephonist. Mr. Baker's enthusiasm is easily pardoned for the discovery that voice currents could be magnetically recorded on a strip of steel was such a striking one that it certainly belongs in that class of discoveries which are illuminated by the spark of genius that never fails to fire the enthusiasm of the scientific mind. The wonderful result achieved by the telegraphone in such an impressively simple manner puts the instrument in the very front rank of invention, and this being so it seems like a most unkind manifestation of the irony of fate that there should be so little practical application for the telegraphone in the telephone industry.

It seems almost sinful that such a beautiful invention should sink, like the phonograph—an equally beautiful and original invention—to the miserable occupation of a cheap toy used only to amuse the very young or the very idle-minded. Yet search as you will you cannot find a place in telephone systems as they are worked to-day where the telegraphone can do a real service. It has been suggested that in the telegraphone lies the germ of the telephonic relay, but it is a germ that will prove very difficult of culture. The telephone relay as a piece of apparatus is almost an insoluble problem; we say "almost" because he would be a rash man who should venture to pronounce any electrical feat impossible. There are telephone relays aplenty, but they will all talk only one way, and a telephone line to give good service must be able to talk both ways. To make a two-way relay out of the telegraphone looks as hopeless as with any other reinforcing instrument. Modern research shows us that for a telephone relay we must look not to relaying apparatus proper, but to a special treatment of the line.

The one practical application of the telegraphone to real telephone work that has been suggested is its use to record a message at a telephone that has been left unattended. On the surface that looks like a good and practical application that would be a real convenience. Yet a little analysis of the proposition reveals innumerable difficulties. For one thing, the vast majority of telephone messages are not messages at all, unless both correspondents are present. They require as a rule immediate attention and an immediate answer. Probably not one message in a thousand would be recorded at a telephone from which no answer could be obtained, even if all telephones were provided with facilities for so recording messages. If the system were adopted every substation would have to be equipped with a telegraphone and with a relay by which the operator could switch the line from the telephone to the telegraphone and back, and to make the thing complete there would have to be a visual indicator that could be set to show the returning subscriber that the telegraphone contained a message for him. As this equipment would largely increase the cost and complication of the stations and switchboards for the sake of perhaps one call in a thousand, few telephone companies would seriously consider the adoption of the device even if it could be proved that its probable use would be much greater than we have estimated.

Patents

A BOOSTER FOR TELEPHONE CURRENTS

TWO patents recently issued to Joseph Lyons, of Washington, and assigned by him to the American Telephone and Telegraph Company, disclose a highly novel method of reinforcing telephone currents on long lines. The originality of the invention is so great and the subject of such interest to telephone men that we give the specification below in full:

My invention consists in a method of and apparatus for reinforcing telephone currents imposed upon a line in any way or manner. The reinforcing of the faint telephone currents I accomplish by reducing the apparent resistance of the line to these currents continuously and practically to any desired extent. In accordance with my invention the telephone currents are primarily caused to produce an alternating field or fields of force varying in frequency and intensity with the frequency and variations of intensity of the telephone currents, and within such field or fields there are rotated electric circuits that are closed upon themselves with a speed that exceeds a certain critical speed. By the rotation of such circuits within the initial magnetic-field or fields the electromagnetic reactance of the telephone circuit is reduced, whereby the initial field or fields and the exciting-currents are reinforced.

Machines for reinforcing faint alternating currents of one definite frequency by causing them to produce an alternating magnetic field or fields and rotating within the latter circuits closed upon themselves with a speed exceeding a certain critical speed have heretofore been suggested for use as constant-potential alternating-current generators, and such machines are set forth in United States patent to Hutin and Leblanc, No. 606,762, dated July 5, 1898. Such machines, however, have heretofore been used only each for the reinforcement of an alternating current of one definite frequency, and the speed given to the closed circuits was calculated and determined with reference to the frequency of the single current that was led to and reinforced by the machine. The rule which governs the operations of such machines is that if the frequency of the alternating current led to

the machine is designated by $\frac{1}{T}$ and if the number of poles of the field excited by these currents is designated by $2n$, then in order that the initial field and the initial current be reinforced the number of revolutions of the circuits closed upon themselves

must exceed the quantity $\frac{1}{nT}$. This rule may also be stated in these words: The number of rotations of the rotor must exceed the frequency of alternations of the alternating current that excites the stator divided by half the number of poles of the latter. My invention is based upon the utilization of the principle embodied in these reinforcing-generators for the reinforcement of multiperiodic varying currents—that is to say, the reinforcement of telephone currents.

In the practice of telephony alternating currents of constantly varying periodicities and intensities are generated, and it has been found that the currents corresponding to the highest pitch of sounds uttered against the telephone transmitter rarely exceed the frequency of eight hundred per second. All other frequencies that occur in practice are below eight hundred per second. In order to reinforce alternating currents of the frequency of eight hundred with a machine of the Hutin and Leblanc type, if the same has, for instance, twelve field-poles, the circuits closed upon themselves have to be rotated with a speed exceeding one hundred and thirty-three revolutions per second. If this is done, then not only the currents having the frequency eight hundred will be reinforced, but all other currents of a lower frequency will also be reinforced, and upon the recognition of this fact my invention is based. Accordingly my invention is practiced by passing the faint telephone currents at any point on the line through the field-coils of a machine of the Hutin and Leblanc type and rotating the armature of such machine with

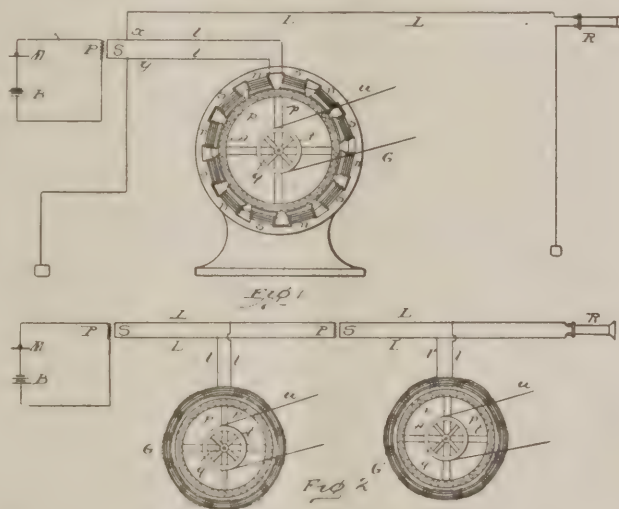
a speed exceeding the number of periods of the highest-frequency current that occurs or is likely to occur in telephony divided by half the number of poles of the field-magnet.

By this process the lower-frequency currents are more reinforced than the higher-frequency currents; but this does not vitiate the reproduction of speech, but, on the contrary, improves the reproduction, since lower-frequency vibrations must be of higher amplitude than those of higher frequency in order to produce sounds of the same intensity as the latter.

In the accompanying drawings, Fig. 1 is a diagram illustrating my invention as applied to long-distance telephony with an unbroken line, and Fig. 2 is a diagram illustrating my invention as employed for long-distance telephony with a line divided into sections.

Like letters of reference indicate like parts throughout the drawings.

Referring now to Fig. 1, there is shown a local circuit containing a microphone M, a battery B, and the primary P of an induction-coil. The secondary S of this induction-coil is connected with the line L L L, having a magneto telephone receiver R at the distant station. This line is here shown as grounded at both ends; but it will be understood that it may be a complete metallic line and that it may be either overhead or underground or submarine. At two points $x y$ this line is tapped by wires $l l$, leading to and completing the circuit of the field-coils of a reinforcing alternating-current generator of the Hutin and Leblanc type above referred to. This reinforcing-generator G is ordinarily composed of a stationary iron field-ring having inwardly projecting radial pole-pieces $n s$. The pole-pieces are wound alternately reversed and are here shown as connected in series (although



they may be connected in multiple arc), so that a current which produces in one pole-piece a north pole will produce in the next succeeding and in the next preceding pole-piece a south pole. This is indicated in the drawings by the letters $n s$. The rotary part of the reinforcer is ordinarily made of an iron ring, faced on each side with a flat annulus A, of copper, and the iron ring as well as the two copper rings are perforated, so as to receive copper pins, rods, or bars p , riveted at each end to the copper rings; all in the manner now well known, and set forth in detail in the Hutin and Leblanc patent above referred to. The copper rings A A, together with the pins p , form a great number of electric circuits of low resistance closed upon themselves, and this system is secured upon a spider, as indicated, and the whole is mounted upon a shaft q , carrying a pulley t , around which passes a belt u , by which motion is given to the shaft from any suitable source of power.

The system as thus represented is operated as follows: Speech uttered against the microphone M causes alternating electric currents to be generated in the secondary S of the induction-coil. One branch of these currents passes through the field-coils of the reinforcing-machine by the conductors $l l$, and another branch passes to the line L L. Both current branches are exceedingly weak, and the branch passing to the line is too weak to cause an audible reproduction of sounds in the telephone receiver R if the line exceeds a certain length; but if now the rotor of the reinforcing-machine is rotated with such speed that its number of rotations per second exceeds the number of periods of the currents due to the sound of highest pitch that is uttered against the transmitter divided by half the number of poles of

the field then the initial and exceedingly weak alternating field excited by the telephone currents is reinforced, and these currents themselves are reinforced. This reinforcement of telephone currents may be carried practically to any desired extent, depending upon the size and speed given to the reinforcing generator and also depending upon the electro-magnetic reactance of the reinforcer. This reactance should be made as small as practicable, and for this purpose the amount of iron entering into the construction of the machine should be made very small, and the iron, if employed at all, should be highly laminated, as is usual with machines of this character. It will be understood that the reinforcing machine may be in series in the line instead of in a branch derived therefrom.

In the ordinary system of telephony the faintness of the telephone currents is due to the great apparent resistance of the telephone circuit, and for this reason telephony can only be successfully practiced over comparatively short lines. With my improved system there is no practical limit to the length of the telephone line, since whatever that length may be its apparent resistance is so largely reduced by the reinforcing operation that speech can be transmitted over very long lines with the same loudness as is now attained upon comparatively short lines.

In Fig. 2 the main line is divided into two parts $L L$ and $L' L'$, connected inductively by the induction-coil $P' S'$. In a branch $l l$, derived from the line $L L$, there is a reinforcing machine G , and in a branch $l' l'$, derived from the line $L' L'$, there is another similar reinforcing machine G' . This division into sections, which may be carried much farther, permits the use of small reinforcing machines upon moderately long sections of lines and the practice of telephony over very long distances. When a line is thus subdivided into sections, it is not necessary that each section be either complete metallic or grounded. Some sections may be completely metallic, and others may be grounded. Nor is it necessary with this arrangement that the two or more reinforcing machines be all driven at the same speed. It is all sufficient if each machine is driven above the critical speed above indicated. So long as this rule is observed it is immaterial what the speeds of the reinforcing machines are.

While my invention is well adapted for use in connection with the ordinary magneto telephone receivers, it is preferable to use telephone receivers without iron or steel cores, and, similarly, it is preferable to use induction-coils without iron cores. Altogether the electro-magnetic reactance of the system should be made as small as possible.

I desire it to be understood that I am not confined to the use of the reinforcing machine hereinbefore indicated, and particularly described in the Hutin and Leblanc patent, No. 606,762, since I may use any other reinforcing-generator operating to reduce the reactance of the line and of its appurtenances for the various frequencies of telephone-currents. It will also be understood that instead of rotating the closed circuits these may be stationary and the field-magnet structure be rotated; also, that I may omit the iron cores entirely or retain them either in the stator or in the rotor of the reinforcing-machine.

In the practice of telephony it has been observed that speech can be transmitted with sufficient distinctness, even though some portions of the sounds uttered against the transmitter are not faithfully reproduced or are lost in the receiver. Particularly is this true when some of the sounds of highest pitch are lost. This being the case, it is in my system not absolutely necessary that particular notice be taken of the alternating currents of the highest frequencies that occur in the transmission of speech. In other words, it is not absolutely necessary to reinforce these very highest frequency currents. It is practicable to lose the sounds corresponding to them without materially affecting the clearness of reproduction. This enables me to rotate the rotor of the reinforcing-machine with lower speed than would be necessary if it were attempted to reinforce all high-frequency currents.

It will now be understood that wherever I speak in the foregoing description and in the claims of the highest-frequency currents that occur in telephonic transmission or that are thrown upon the line I mean those highest-frequency currents which are still essential to the intelligible reproduction of the sounds uttered against the transmitter.

There are two patents, one covering the method and the other the arrangement of apparatus, the specification of both patents being the same. The claims of the patent covering the method are as follows:

1. The improvement in the art of telephony, which consists in causing telephone-currents produced upon a line to establish

an initial magnetic field or fields the lines of force of which intersect circuits closed upon themselves, and producing a relative movement between the field structure and closed circuits with a speed exceeding the number of periods of the telephone-current of highest frequency divided by half the number of poles of the field, substantially as described.

2. The method of reinforcing telephone-currents upon a line, by causing such currents to produce an initial magnetic field, and rotating within the latter a closed electric circuit or circuits, with a speed exceeding the number of periods of the telephone-current of highest frequency, divided by half the number of poles of the field substantially as described.

3. The method of reinforcing telephone-currents upon a line, by causing such currents to produce an oscillating magnetic field of force, and rotating within the latter a circuit or circuits of low resistance, closed upon themselves, with a speed exceeding the number of periods of the current impulses of highest frequency, divided by half the number of poles of the field, substantially as described.

In the patent covering the arrangement of apparatus there are but two claims, as follows:

1. A system of telephony comprising a line upon which telephone-currents are imposed, a field magnet or magnets charged by currents from the line, and an armature composed of circuits closed upon themselves, capable of being rotated within the field thus produced, with a speed exceeding the number of periods of the currents of highest frequency on the line, divided by half the number of poles of the field, substantially as described.

2. A system of long-distance telephony, comprising a transmitter, a receiver, and a line composed of two or more sections that are inductively connected together; with a field magnet or magnets for each section of the line, charged by currents from the same, and a circuit or circuits of low resistance closed upon themselves, for each field-magnet or system of field-magnets, and means for rotating each circuit or system of circuits within the corresponding field, each with a speed exceeding the number of periods of the telephone-currents of highest frequency, divided by half the number of poles of the corresponding field, substantially as described.

WILLIAMS-ABBOTT CO.'S ANNUAL OUTING

THE employes of the Williams-Abbott Electric Company, Cleveland, O., gave a picnic and excursion Sunday, August 10, to Vermillion, O. This is the second annual outing of the same kind given by them. At Shadduck's Lake Park, where the picnic was held, all kinds of games and trials of physical prowess were competed in by the merry-makers for prizes donated by Cleveland merchants and others. THE AMERICAN TELEPHONE JOURNAL offered four prizes for one of the races, as follows: First prize, Miller's Telephone Practice; second prize, Webb's Telephone Hand Book; third prize, Homan's A. B. C. of the Telephone, and fourth prize, a year's subscription to the AMERICAN TELEPHONE JOURNAL. The following employes of the Williams-Abbott Company are announced as the winners of these prizes: First, J. Nagel; second, F. Reilinger; third, J. Walter; fourth, G. Paquet. Many valuable prizes were competed for and the excursion was a complete success from start to finish.

THE GERMAN TELEPHONE SERVICE

CONSUL-GENERAL RICHARD GUENTHER, stationed at Frankfort, Germany, has sent in the following statistics on the telephone service in Germany to the State Department:

"The telephone service of Germany is carried on by the Post-Office Department. According to an official report, the cost of the entire plant, up to April 1, 1902, amounted to about \$42,000,000. Up to April 1, 1901, the cost had been \$36,600,000. At the beginning of the present year, 2,024 places had public telephone stations, with 322,281 miles of line. These stations averaged 2,205,966 conversations per day, or about 804,000,000 per year. The following cities have the greatest number of public telephone stations:

Berlin, 51,561; Hamburg, 20,823; Frankfort, 9,271; Dresden, 8,914; Leipzig, 8,725; Cologne, 7,484.

The total number of employees in this service is 8,189, of which Berlin has 1,712.



New Companies

BUNKER HILL, IND.—Bunker Hill is to have an Independent telephone system. A company for building the line has already been organized by W. H. Wiles, president of the Bunker Hill bank, and will soon begin stretching the wire.

DARLINGTON, IND.—The Darlington Co-operative Telephone Company has been incorporated, with a capital stock of \$2,000. Directors: George W. Booher, George W. Conrad and John D. Coltrave.

DES MOINES, IA.—Articles of incorporation have been filed for the Ida County Telephone Company; capital, \$50,000.

BAXTER SPRINGS, KAN.—The Baxter Telephone Company, of Baxter Springs, has been incorporated, with a capital stock of \$10,000.

JACKSON, MINN.—Capitalists of Jackson are organizing an Independent telephone company, with a capital stock of \$20,000. Its object will be to connect the surrounding country by telephone. Many of the farmers are taking stock in the new company.

ST. PAUL, MINN.—The Duluth & North Shore Telephone & Telegraph Company has been incorporated to build and operate lines in St. Louis, Lake and Cook counties and elsewhere. The company has a capital of \$25,000, and the directors are Arthur Howell, William Elder, E. Frankenhof, Eby Gridley and Leo A. Ball.

HILTON, N. Y.—J. E. Cooper, editor of the local newspaper, is constructing a telephone system here. Work has been begun setting the poles and twenty-seven subscribers are already booked.

BOILING SPRINGS, N. C.—The Boiling Springs Telephone Company, of Cleveland County, has been incorporated, with a capital stock of \$1,000. D. J. Hamrick and others stockholders.

MINSTER, O.—The Minster Home Telephone Company, of Minster, Auglaize County, has been incorporated, with \$10,000 capital stock, by J. W. Eiting, L. L. Dine, F. J. Maisen, John Lauferswiler, M. H. Osborn and others.

STROUD, OKLA.—A territorial charter has been granted to the S. S. S. Telephone Company, of Stroud, for twenty years, with \$10,000 capital. The incorporators are Ezra Brown, John A. Meinecke and Horace M. Jarrett, of Stroud; James F. Noble, of Shawnee, E. D. Sims, of Roff, I. T., and D. McKinstry, of Perry.

CONESTOGA, PA.—The Conestoga Telephone and Telegraph Company will make application for a charter to the Governor, Monday, Aug. 25. The organizers are: Levi Beiler, Aaron K. Stultzfus, S. H. Mast, S. M. Petershime, H. M. Hertzle, Samuel Deichley, H. B. Best, Levi Keller, Jacob Hartz, C. S. Riehl and others, all enterprising farmers of the southwestern section. Each subscriber furnished his own quota of poles and the work was also done by them. The present terminus is Morgantown, but the company ultimately expects to reach Reading in order to connect with either the Pennsylvania or Consolidated lines.

CLEBURNE, TEX.—The Cleburne and Bono Telephone Company, of Cleburne, has been incorporated, with a capital stock of \$1,000. Incorporators: J. H. Mims, T. J. Honea, Cleburne; J. H. Sanders, Bono. Purpose, to build and maintain telephone line from Cleburne through Bono to ranch headquarters of J. H. Mims, M. L. Kennard, T. J. Honea and J. B. Sanders and other points in Johnson and Somerville counties.

OSHKOSH, WIS.—The Winnebago Telephone Company, of Oshkosh, has been incorporated, with a capital stock of \$150,000. Incorporators, A. B. Ferdinand, Walter L. Gold and Kate Kershaw.

Legal

BALTIMORE, MD.—Dr. Leon B. Robinson, a Baltimore druggist, has filed a bill in the Circuit Court against the Maryland Telephone and Telegraph Company, upon which bill Judge Dennis signed an order restraining the company from removing a telephone from the premises of the plaintiff, the bond being fixed at \$500. The bill recites that on January 12, 1901, Dr. Robinson entered into a contract for telephone service for one year at \$48 per year, with privilege of renewal for five years. The service was furnished to July 17 last, when, it is alleged, notwithstanding all charges are paid up to and including the quarter ending September 30 next, the

company cut out the service and has refused to answer calls or to furnish any service except that of a pay station, thereby, it is claimed, making unlawful discrimination against the plaintiff.

Financial

LAFAYETTE, IND.—The State Tax Board has appraised the telephone companies for taxation as follows: Lafayette Telephone Company, 595 miles of wire, \$170 per mile; Montmorenci Telephone Company, 45 miles of wire, \$20 per mile; Otterbein Telephone Company, 187 miles of wire, \$35 per mile; Tippecanoe Romney Telephone Company, 468 miles of wire, \$25 per mile; Tippecanoe Telephone Company, 20 miles of wire, \$50 per mile; Odell Telephone Company, 305 miles of wire, \$20 per mile, and People's Co-operative Telephone Company, 75 miles of wire, \$5 per mile.

DES MOINES, IA. The following are the telephone valuations in Iowa over \$15,000, as assessed by the Executive Council of the State:

Iowa Telephone Company, Davenport, \$1,010,496; Cedar Valley Telephone Company, \$96,635; Mutual Telephone Company, Des Moines, \$87,250; Dubuque Telephone Company, \$70,000; Greene & Western Telephone Company, Mason City, \$64,000; Western Electric Telephone Company, \$58,500; Missouri Valley Telephone Company, \$59,265; Cedar Rapids & Marion Telephone Company, \$57,250; American Telegraph and Telephone Company, \$51,940; Boone County Telephone Company, \$47,420; Fort Dodge Telephone Company, \$44,000; Hawkeye Telephone Company, Belle Plaine, \$44,150; Nebraska Telephone Company, \$40,990; Ottumwa Telephone Company, \$53,137; Vinton & Benton Telephone Company, \$35,000; New State Telephone and Telegraph Company, \$34,000; Hawkeye Telephone Company, Perry, \$34,446; City Telephone Company, Tabor, \$32,500; Interstate Telephone Company, Dubuque, \$30,000; Johnson County Telephone Company, \$28,587; Marshall Telephone Company, \$27,240; Oskaloosa Home Telephone Company, \$26,600; Nevada Mutual Telephone Company, \$21,650; Sumner Telephone Company, \$21,580; Northern Iowa Telephone Company, \$20,000; Northern Telephone Company, Fonda, \$20,175; E. H. Martin Telephone Company, \$21,000; Maquoketa Telephone Company, \$22,400; Linn County Telephone Company, \$22,400; Creston Mutual Telephone Company, \$24,750; Interstate Telephone Company, Grinnell, \$24,000; Jasper County Telephone Company, \$24,600; Central Telephone Company, Rockwell City, \$19,910; Musson Bros.' Telephone Company, \$18,225; Jefferson County Telephone Company, \$15,440; Lineville Telephone Company, \$15,855; Seymour Telephone Company, \$15,860; Southern Iowa Telephone Company, \$15,500; Tri-City Telephone Company, \$16,875.

BOSTON, MASS.—The directors of the Western Telephone and Telegraph Company have declared a semi-annual preferred stock dividend of 2 per cent., payable August 30 to stock of record August 16.

BOSTON, MASS.—Operations of the Mexican Telephone Company for June and four months are thus reported in Mexican currency:

	1902.	1901.	Increase.
June.			
Earnings	\$20,117	\$17,449	\$2,668
Expenses	9,251	9,281	*30
Net	\$10,866	\$8,168	\$2,698
From March 1—			
Earnings	\$78,547	\$69,351	\$9,196
Expenses	40,972	37,859	3,113
Net	\$37,575	\$31,492	\$6,083
Subscribers	4,167	3,654	513
Subscribers	\$19,681	\$17,001	\$2,680

*Decrease

Elections

ROCKVILLE, INDIANA.—At the third annual meeting of the stockholders of the Park County Telephone Company, a 3 per cent. dividend on the capital stock of \$12,000 was declared. The following were elected as directors: Albert M. Adams, Jesse B. Connolly, John L. Swain, Will B. Thomson, E. O. Barnes, F. H. Stark and Frank M. Boyd. The directors immediately elected the following officers: President Albert M. Adams; secretary, Will B. Thomson; treasurer and general manager, Frank M. Boyd.

HARRISON, ME.—The Bolster's Mills Telephone and Telegraph Company at its annual meeting elected the following officers: President, Ernest L. Gay; clerk, Nathan C. Pinkham; treasurer, J. Bennett Pike; directors,

THE WEEK'S MESSAGES *Continued*

Albert J. Stearns, Walker B. Mills, Albert W. Weston, Albert Chute, Alphonso Moulton. The report of the treasurer showed a gratifying financial condition, and the directors declared a semi-annual dividend of three per cent. on all stock purchased on or before March 1, 1902. This company was organized one year ago, and the particular purpose which its founders had in mind was to build a telephone line from Bolster's Mills to Norway Lake to connect with the Eastern Telephone Company's line at that place, but there was very soon a call for the line to be extended into various parts of Harrison, and there is now over twenty miles of line in operation, covering the greater part of the town, with twenty-seven instruments, and an exchange at Bolster's Mills.

Franchises

SAN BERNARDINO, CAL.—C. F. Guthridge, of Los Angeles, has applied to the City Board of Trustees for a franchise for a new telephone system in San Bernardino, to compete with the Sunset. In his application Mr. Guthridge offers to give the city the use of five telephones free of cost, the use of the top cross bar of the poles for fire alarm and police telephone wires, and to give the city 2 per cent. of the gross earnings of the company after the first five years. He agrees to spend \$18,000 within two years on the system, to have no "party" lines, and that the maximum charge for business telephones shall be \$3 a month and for residences \$2 a month.

SAN DIEGO, CAL.—Judge L. L. Boone has made application to the City Council for a franchise to build and operate a telephone system in this city. It is stipulated that Judge Boone or his assigns and successors shall expend the sum of \$15,000 at least within the first six months after the franchise is granted, \$15,000 more within nine months, \$15,000 more within twelve months, \$15,000 more within fifteen months, and \$15,000 more within eighteen months, or a total of \$75,000 within a year and a half. Twelve telephones for the use of the municipality will be supplied free of cost. No name is mentioned in the petition save that of Judge Boone, but it is understood that the request is made in the interest of the Home Telephone Company, of Los Angeles.

GOSHEN, IND.—The Farmers' Mutual Telephone Company, of Clinton Township, has been granted a franchise to run its line into Goshen. The Farmers' line was originally connected with the Home Company. Disagreement occurred and the Clinton Township service was transferred to the Bell Company temporarily. The Bell people cut the farmers out August 1, hence the petition for franchise.

BURLINGTON, IA.—Dr. Emil Dorn has presented a petition to the City Council, asking for a franchise to construct and operate a telephone system here.

SHELBYVILLE, KY.—The City Council adopted an ordinance providing for the sale of the franchise to construct and operate another telephone system in Shelbyville. The Cumberland Telephone Company, which has been operating the telephone system here for many years, made a bitter fight against the ordinance, which has been pending in the board for several months. There were a number of interested telephone men at the meeting, and it is said the Louisville Home Telephone Company is behind the new venture. Mayor Willis will offer the franchise at public outcry next month. The minimum price has been fixed at \$500. Under this ordinance maximum rates were fixed at \$2.25 for business and \$1.25 per month for residence telephones. It is also stipulated that the company operating under this franchise must install the latest and most improved modern equipment and appliances. Work must be commenced on the new system within sixty days after purchase of the franchise. The ordinance also provides that the company operating under this franchise shall not consolidate with, or be absorbed by, any competing company, under penalty of forfeiture of its franchise. The buyers of the franchise are to give a bond of \$2,000.

PITTSFIELD, MASS.—The first franchise to be granted to the Berkshire County Telephone and Telegraph Company has been granted by the Pittsfield City Council. The franchise gives the company permission to do business in the city, maintaining its poles and wires in a large number of streets. Representatives of the company are also in Westfield, where they will ask for a franchise. They are also working in North Adams and other towns in Western Massachusetts for franchises.

ST. CLOUD, MINN.—President Armitage, of the Minnesota Rural Telephone Company, has applied to the City Council for a franchise for a line from Princeton through Duell and Foley to St. Cloud and connecting with the Morrison County Telephone Company's lines.

HANNIBAL, MO.—The City Council has passed an ordinance giving Chicago capitalists a franchise to construct a telephone system in the city. In consideration for the franchise the company is to pay the city \$500, 5 per cent. rental for all the telephones installed and furnish the city ten telephones free of charge. Work on the new exchange is to be commenced this fall.

CHICAGO JUNCTION, O.—The Bell Telephone Company recently asked for a franchise at Chicago Junction. At a meeting of the City Council recently the franchise was refused by a unanimous vote.

EASTON, PA.—Messrs. Strouse and Bodine, representing a telephone company of Hunterdon County, whose line is now in service in nearly all the towns in that county, have asked for a franchise to erect a telephone system here. Their line is extended to Bloomsbury, and they are desirous of reaching Phillipsburg and Easton, by way of Stewartville.

CLARKSVILLE, TENN.—The City Council will grant a franchise to an Independent telephone company. The capitalists who were here some weeks ago looking over the city and whose business was kept a secret, are the promoters of the enterprise. It is understood that the company will put in a plant to cost \$60,000. They will compete with the Bell Company here.

Competition

ROCKPORT, IND.—The telephone war which was commenced here some months ago between the Cumberland Company and the Home Telephone Company, is still waging. The sentiment of the people seems to be with the Home Company, and practically all of the business men of the town have ordered the Cumberland telephones taken out of their places of business, substituting the service of the Home Company.

TINLEY PARK, ILL.—The Interstate Telegraph and Telephone Company is trying to get a permit from the village officers to run its Northwestern line to this place. The permit, no doubt, will be granted, and the poles will soon be constructed, as the line is already completed up to about four miles from the village. A number of subscribers are talking about putting in the telephones, saying it is cheaper than Chicago Telephone Company. Some intend to have their Chicago telephones taken out.

JACKSON, TENN.—The Jackson Home Telephone Company, a corporation backed by Wilkesbarre, Pa., capitalists, is proceeding as rapidly as possible with the construction of the new Independent telephone system for Jackson. It is the intention of this company to give a cheaper rate than is charged by the Cumberland Telephone and Telegraph Company, which has heretofore had the field to itself. It is said that the new company secured contracts from 700 subscribers in the city previous to beginning work. It will erect an exchange with a capacity of serving at least 2,000 subscribers. The construction will be modern and up to date, and all wires in the fire limits will be laid under ground in conduits.

Combinations

NEW ALBANY, IND.—The system of the Home Telephone Company, of this city, has passed into the control of the Home Telephone Company, of Louisville. Negotiations have been in progress for several months. The consideration has not been made public, but it is stated that the stockholders of the local company in consideration of turning over their stock have acquired stock in the Louisville company and will also be represented on the board of directors. The Louisville company has already taken possession of the system and will make a number of improvements. A \$12,000 switchboard is to be installed in the exchange building. The two systems will be connected by a cable laid across the river on the Kentucky and Indiana bridge. The Louisville company has orders for 6,000 telephones and has 3,000 in operation. It is believed that the merging of the two companies will result in the abolishing of the toll rates between this city and Louisville.

AKRON, N. Y.—The Akron Telephone Company has been sold to a Buffalo company, rumored to be the Frontier Company. A 300-drop switchboard is to be installed, and connections made with Buffalo, Batavia, Medina and surrounding villages.

SODUS, N. Y.—C. O. Harris, representing the Rochester Telephone Company, is here conducting negotiations for the purchase of the local telephone exchange. The Rochester men have just returned from Syracuse, where they arranged to meet a Syracuse telephone company at Oswego. They have secured the right of way from Rochester to Sodus and will start a toll system between the various towns.

SANDUSKY, O.—It is rumored that the Sandusky Telephone Company operating what is known as the Harrison system in this city, has been sold out to a syndicate. Hon. J. F. Laning, of Norwalk, has purchased a majority of the stock, and will take charge on September 1. The local plant has given the Bell company a hard push. Some weeks ago eastern parties were here looking over the plant with an intention of purchasing, but delayed the deal, and in the meantime a syndicate, headed by Hon. Jay F. Laning, purchased the plant. The Laning company already owns property in Huron and Sandusky counties, and is daily making additions.

RICHMOND, VA.—The absorption of the Winchester Telephone Company by the United Telephone and Telegraph Company, of Philadelphia, has been officially announced. The new company controls 30,000 telephones, and will acquire 30,000 more. The officers of the new company are: President, R. T. Barton, of Winchester; vice-president, W. D. Bernard, of Philadelphia; treasurer, S. R. Caldwell, of Philadelphia; local manager, S. L. Hoover; general manager, W. J. Latta, Philadelphia; directors, T. J. O'Neill, Hanover; C. M. Clement, Sunbury, and S. H. Hansbrough, and W. H. Baker, Winchester.

THE WEEK'S MESSAGES Continued

Underground

AUGUSTA, GA.—In November of last year, the city council passed an ordinance ordering wires under ground within ten years. Recently the Strowger Telephone Company ordered material to begin this work. A short time before the council committee made a new ordinance on the subject, putting on an occupation tax and exacting that telephone charges shall never be increased over what they now are. The Strowger announced its intention of going underground under the 1901 ordinance, which carried no occupation tax or rate regulation. The city officers said they should not, threatening their arrest if they made the attempt. Now, however, the council committee has said the Strowger company is in its legal rights, and told it to go ahead under the 1901 ordinance.

GRAND RAPIDS, MICH.—Manager Tarte, of the Citizens' Telephone Company has filed a communication to the common council asking for permission to extend the underground system of the company in the north end of the city. He also asks for additional streets for the erection of poles and wires.

JEFFERSON CITY, MO.—The city council has granted permission to the telephone company operating here to put some of its wires underground.

Construction

LUVERNE, ALA.—The Troy and Andalusia Telephone Company, is progressing nicely with its line. Luverne will soon be connected by long distance with Brantley, and next with Andalusia.

CHESTER, ILL.—The Gordon Telephone Company has received its cable to be placed under the river from Chester to Clearyville, and as soon as laid the line will be extended to Perryville, St. Mary's and other towns in Missouri.

DE WITT, IA.—The De Witt Telephone Company will construct a line to Low Moor.

DUNLAP, IA.—The Woodbine Telephone Company is erecting a new rural line northwest from town. Another line is projected to run west and a little south from town.

ELDRIDGE, IA.—Henry Wise is constructing a telephone line to connect with the rural line a mile north of town.

RED OAK, IA.—The Montgomery Telephone Company will build an exchange to take care of the local business here.

WELLMAN, IA.—A through telephone line is being constructed between here and Washington by George Sharpe.

LOUISVILLE, KY.—The Louisville Home Telephone Company has secured its right of way to French Lick Springs, via New Albany and Milltown, and will begin the construction of this line at once, having it completed by September 15.

FREDERICK, MD.—The Frederick County Telephone Company expects to extend its system from Petersville to Burkittsville within the next sixty days.

EVANSVILLE, MINN.—R. Vallquist, of Holmes City, president of the Interurban Telephone Exchange Company, says his company has already ordered a switchboard and 25 telephones for Evansville, as well as poles and other supplies for the necessary line. The work of constructing the line has been delayed considerably by the difficulty of securing help enough to set the poles and string the wires.

MARYVILLE, MO.—A new telephone line is being planned to connect Maryville and Barnard, and will probably be in operation in the near future.

GREAT FALLS, MONT.—Secretary A. W. Warr of the Lewiston-Great Falls telephone line says the rebuilding of the Neihart branch is completed, and work on the line from here to Armington is now in progress. When completed there will be through wire from Lewiston to Great Falls, from which Armington will be of copper, and a complete metallic circuit of copper wire from Armington to Great Falls, relieving the through wire of practically all the business of those points. From Belt to Great Falls the business is very heavy and requires a metallic circuit. This is now extended to Armington, Sand Coulee and Stockett, the last named of which has not previously had any telephone service at all.

BATAVIA, N. Y.—The Independent Telephone Company of Elyria, which is building an exchange in Batavia, is extending its line eastward along the State road through Le Roy, to the Caledonia village line. The company's representative has had some talk with the village trustees of Caledonia regarding a franchise, and though no definite arrangements have been reached, it is highly probable that an effort will be made to establish an exchange there.

CORTLAND, N. Y.—The Home Telephone Company of this city is enlarging its system and stretching out to all the nearby places. It has run poles and extended its lines all about the village of McGraw. As soon as the instruments come they will be connected, and another village will be added to those already on the circuit. The strike of the freight handlers in Chicago has tied up the instruments; but they are expected to be forwarded in a few days, when they will be immediately connected. The

company is also setting poles and stringing wires west through McLean, Dryden, Freeville and Etna to Ithaca. Another line is being run south to Marathon by way of Freetown Corners. The completion of these lines, with those already in commission will supply all the villages of the county with a telephone service second to none.

E. AURORA, N. Y.—The Haines Telephone Company is busy setting poles for its telephone lines. It has them nearly all placed in the south part of the village, and is rushing the work so as to have the plant completed as soon as possible.

GRAND ISLAND, N. Y.—The work of the Grand Island Telephone Company is being pushed. The cable across the river will be inclosed in an iron tube and placed in a trench for protection. The new line is being substantially built.

PHELPS, N. Y.—Representatives of the Interocean Telephone Company are here for the purpose of securing the right of way through this section. The route as laid out runs from Geneva to Phelps past the Lehigh station and north to Plainsville road and west to Clifton Springs.

WOLCOTT, N. Y.—A telephone line is to be constructed to this place from South Butler and thence north to Desbrough Park and North Wolcott.

BRISTOL, N. J.—The Standard Telephone Company has purchased its new local exchange. It is expected that the new quarters will be occupied by September. The company is making rapid growth, and now has connections with Lancaster, Harrisburg and Altoona.

BROWN'S MILLS, N. J.—Work on the telephone line under construction to connect the Burlington county system at this place and Johnstown is being rapidly pushed. It is proposed to connect Pointville, Wrightstown, Sykesville, Jobstown, Juliustown, Jacobstown and New Egypt at once, and later other towns. The construction is fitted for long distance work to which it is expected to connect.

RAHWAY, N. J.—A new telephone line between this city, Woodbridge and Carteret is being constructed.

GRAND FORKS, N. D.—The contract for the exchange building at Grand Forks has been awarded to a firm in that city at \$18,198. The one at Fargo will cost about \$22,000.

SHEYENNE, N. D. A farmers' telephone line is being built out of Sheyenne.

W. CHESTER, PA.—Workmen of the United Telephone Company, formerly known as the Chester County Telephone Company, are making extensions to improve the service. They are now at work on a spur from Unionville via Upland or Leonard, running about four miles. On this route are about twenty new subscribers. An extension is also to be made, from London Grove south. There are about 1,600 telephones in Chester County, belong to this system, and additions are being made at the rate of about fifty per month.

BRIDGEPORT, TENN.—The Moody Telephone Company, of Scottsboro, is extending its line in Bridgeport.

HARRIMAN, TENN.—The People's Telephone Company is constructing a line between Harriman and Clinton.

DENNISON, TEX.—W. C. Ross, in charge of construction for the Grayson County Telephone Company, which is putting in a new telephone exchange in this city, says that within a few days the company will start stringing wires from Denison north, through Indian Territory. The poles are already set and ready for the wire. The company will have the line in operation from Denison to Muskogee, I. T., by October 1, 157 miles of wire being stretched by that time. The new telephone system has an exchange just completed in Sherman. The two exchanges will be operated as one, all subscribers in either town being privileged to talk to all subscribers in the other town without any toll charge. A force of forty-six men is here completing the local exchange getting it ready for operation by September 10. The switchboard has already been placed.

GEORGETOWN, TEX.—A new long distance telephone system will soon be in operation here, connecting the local exchange with Austin, San Antonio, Houston, Galveston, Hillsboro and all intermediate points. The poles have been set, and the line between Georgetown and Taylor will soon be in operation.

SMITHFIELD, VA.—The Smithfield Telephone Company is putting a network of wires over the county. It has just put up a line from Smithfield to Berryman's, in Surry County, and is now running a line from Surry Courthouse to Dendron. There is now a telephone in almost every store and farm of any importance in the county.

MORGANTOWN, W. VA.—The People's Telephone Company is constructing a metallic circuit line between Morgantown and Fairmont. About \$25,000 is being spent in the improvement of its service.

MOUNDSVILLE, W. VA.—The National Telephone Company is pushing its work rapidly towards Moundsville. Over a hundred subscribers are anxiously waiting to see the men raising the poles for the cables. It is rumored that they will combine with the Federal Telephone Company, and there will be no change in the location of the office. A large number

THE WEEKS MESSAGES *Concluded*

of poles have been shipped here, and the work of erecting them will soon begin. The Federal is doing business at Moundville now, and there is no doubt in the minds of well informed persons that it will co-operate with the National.

WAUSAU, WIS.—The Marion & Northern Telephone Company has just entered into a contract with the Wausau Telephone Company to make connections, both companies extending their lines and meeting at a point in the eastern part of Marathon County. In addition to extended service now enjoyed by patrons of the local independent company, this move will give connections with Kelly, Hatley, Ringle, Norris, Eland Junction, Birnamwood, Antigo, Wittenburg, Clintonville and nearly all towns east as far as Green Bay. Work on extensions of both lines will commence at once.

Miscellaneous

SAVANNAH, GA.—The report that the control of the Georgia Telephone and Telegraph Company, of Savannah, had passed into the hands of the Southern Bell Telephone Company, is denied emphatically by President W. A. Bisbee, of the Georgia Company.

PHILO, ILL.—The Philo telephone exchange is now connected with Champaign, Urbana and Sidney.

AUDUBON, IA.—The county telephone lines known as the Al Miller and the Harvey Maharg lines are completed. These lines belong to the Farmers' Audubon County Mutual Telephone Association. Two or three other lines of the association are up and will soon be ready for use. The association has made arrangements with the Hocker Company, and will run into the central office of the Hocker Company, and connect with the telephones here in town without exchange cost.

CENTERVILLE, IA.—The Centerville Telephone Company has installed a new toll board in its local office. The toll lines will be operated separately from the local lines.

CUSHING, IA.—A local telephone service has been installed here.

KEOSAUQUA, IA.—The new telephone line from Keosauqua to Bonaparte, which runs out through Vernon Prairie, has been completed.

SHENANDOAH, IA.—The directors of the Independent Mutual Telephone Company held a special meeting recently, and made a contract for the construction of the Independent exchange with Otto Wettstein, of La Porte, Iowa. Mr. Naven, of La Porte, one of the directors, resigned, and in his stead was elected Mr. W. F. Brocksmit, late freight auditor of the B., C. R. & N. railroad, at Cedar Rapids, who was also elected secretary and manager of the new concern. The material has been ordered, and will be on the ground as soon as possible.

SANDUSKY, O.—C. C. Curtis, manager of the Sandusky Telephone Company, denies that it has been sold to a syndicate headed by Jay F. Laning, of Norwalk.

READING, PA.—The Consolidated Telephone Company now has about 300 of its subscribers connected with its exchange, and others are being made as rapidly as possible. Some delay was caused in this work because of the absence of cables.

SWEETWATER, TENN.—The new telephone line to Fork Creek is now in operation, and this, with the other three local lines and the long distance, gives Sweetwater communication with almost every neighborhood around the town.

FAIRMONT, W. VA.—The Consolidated Telephone Company at Fairmont, suffered \$4,000 loss by a fire in its main exchange. The telephone system is completely disabled.

Personal

PRINCETON, IND.—F. Parrett has resigned his position as manager of the Independent Telephone Company, and has been succeeded by Charles Stevens.

PITTSTON, PA.—Superintendent N. D. Smith, of the local branch of the People's Telephone Company, has resigned, to take effect August 27. He will become the general manager of a new system which is now under course of construction at Jackson, Tenn. Mr. Smith has been connected with the local branch of the People's telephone service two years. When he came here there were just 81 subscribers on the list, and they were all in the business section. To-day, conditions are different. The wires extend to all portions of the city and the surrounding borough, and there are over 600 telephones in use. Where the average number of calls were 300 two years ago, now there are 10,000 a day. Besides being the manager of the business of the company, Mr. Smith has also been the foreman of the construction corps which he has had at work erecting new lines. He has constructed all the lines in the city, and to Exeter, Wyoming, Hughestown, and has now under course of construction a trunk line to Centremoreland, and thence to Tinkhannock, where it will join another trunk line with connections in New York State. Long distance connection with Scranton has also been established.

TRADE NOTES

THE UNIVERSAL TELEPHONE RECEIVER HOLDER COMPANY, Chicago, has received a preliminary order from the Mutual Telephone Company, Nevada, Iowa, for supplying the telephones of the latter company with receiver holders. Arrangements have been made by which the following companies will handle the Universal receiver holder: North Electric Company, Cleveland, O.; Farr Telephone and Construction Supply Company, Chicago; Central Electric Company, Chicago; Sumter Telephone Manufacturing Company, Sumter, S. C.; Illinois Electric Specialty Company; S. B. Alexander, Jr., Company, Charlotte, N. C.; Haines & Noyes Company, Chicago; Western Electrical Supply Company, St. Louis, Mo.; Warner Electric Company, Muncie, Ind., and Illinois Electric Company, Chicago, Ill.

THE AMERICAN VITRIFIED CONDUIT COMPANY, New York, has filed a bid for furnishing conduits for the municipal telephone system in St. Petersburg, Russia. This contract will be one of the largest and most important ever given for underground construction and will require 1,700,000 feet of ducts.

THE W. C. NAGEL ELECTRIC COMPANY, Toledo, has just published a neat and convenient blank estimate form for telephone engineers who contemplate new work or rebuilding. It contains 236 printed items, properly ruled and ready for the insertions of quantities and prices of supplies. These forms will be found very convenient, and also will enable an engineer to keep a record for checking costs of construction, future estimates, etc. Copies will be mailed free on application.

The Nagel Company has also ready for distribution its new bulletin, No. 3, and discount sheet on pole-line construction material.

MR. FRANK B. COOK, of Chicago, has gone for an extended tour of the Western cities, his first stop being in Los Angeles, Cal. While the main object of his trip is for a much needed rest, Mr. Cook will look over the Independent field in all the States he visits, returning about the first of September by way of Portland, Ore.

PLANTS FOR SALE

TELEPHONE PLANT FOR SALE—160 telephones, 100 miles of toll lines; excellent opportunity for extending business; will sell for \$12,000; pays 15 per cent. net on this amount. Address TELEPHONE CO., care of AMERICAN TELEPHONE JOURNAL.

WANTED

POSITION in exchange of from 150 to 500 subscribers as wire chief or inside workman. Have had five years' experience in the telephone business and have thorough understanding of every branch; taking care of five exchanges at the present time. Address, WIRE CHIEF, care AMERICAN TELEPHONE JOURNAL.

POSITION in exchange of from 150 to 500 subscribers, as manager or assistant manager. Experience in construction and switchboard work; best of references. Address JAMES C. THURSTON, North Vernon, Ind.

WANTED.—Position as manager of exchange of 100 or 200 subscribers; or as inspector or traveling salesman for supply house. Eight years' experience; best of references furnished. Address G., Box 125, Monroe, Ga.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISSELL CO., Toledo, Ohio.

WANTED.—A good transfer boy to take care of 125 city and 130 country telephones. State lowest wages and experience. Address VIRGIL A. GEIGER, Churubusco, Ind.

SUPERINTENDENT of construction company, position as superintendent or manager of exchange of 1,500 subscribers or more; gilt edge references furnished. Address SUPERINTENDENT, AMERICAN TELEPHONE JOURNAL.

The American Telephone Journal

VOLUME VI SATURDAY, AUGUST 30, 1902 NUMBER 9

LONG DISTANCE TELEPHONY—I.

BY P. KERR HIGGINS

LONG distance telephony was scarcely known before 1883. Short interurban lines had been run, but were limited in length and were generally of iron wire. The fact of being able to talk over 100 miles was considered then a wonderful achievement. During the year 1883 experiments were conducted on lines expressly built for that purpose by the then American Bell Telephone Company. These lines were made of hard-drawn copper wire, and connected New York and Boston, a distance of about 240 miles. They gave fairly good results, and much valuable information was obtained, demonstrating various curious effects that are now common knowledge. Shortly after this the American Telephone and Telegraph Company was organized, and began the construction of long distance lines in all directions. To-day the lines of the Bell company and of the Independent companies form one huge network of telephone wires covering every State in the Union, and conversations are now daily being carried on over lines nearly 2,000 miles long. The line between Chicago and Boston was completed in October, 1892, being 1,026 miles long. It gave better results than lines 100 miles long in 1882. It is an actual fact that long distance

FRONT.

ELAPSED TIME.		TIME CONNECTED.		THROUGH.
Calculagraph Stamp.		Calculagraph Stamp.		
Party calling.....				
Party wanted.....				
Party at.....				
.....				
Opr.....	First Period.....			
Date.....	Overtime.....			
Clerk.....	Rate Message.....			
Mgr.....	Total.....			
Filed.....	Remarks.....			
.....				

FIG. 1.

telephony has had serious effect on railway passenger traffic, as it is now possible to transact business from one's own office with a party hundreds of miles distant in a very few minutes and at small cost, which in former years took a week and the expenditure of a large sum of money. A man can now place an order with a broker in Chicago, and, by means of a special wire to Wall street, the sale or purchase can be effected and an answer received in less than five minutes from placing the order. This

is a daily occurrence. The importance of the long distance branch of the telephone business to the Independent forces cannot be over-estimated, for on it to a large extent depends future success. The merchant demands connection with his customers; these are often in the country or in small villages, and the company which reaches them and gives the best service gets and holds the business. The Independents have shown their appre-

BACK.

RECORD.

Line in trouble.....
Line busy.....
Messengers' report.....
Not in city.....
Not at home—word left.....
Not known.....
Will call.....
Remarks.....
.....
.....
.....
.....
.....

FIG. 2.

ciation of this, and where the Bell Company had only a single toll station formerly, the Independents have established a local exchange. So far this is good, but many Independent companies made one mistake which they now seem to be endeavoring to remedy, namely, when the toll line was built, the requirements of the hour only were considered, and the result was poor and inadequate construction, which now involves the necessity for rebuilding. It is a safe axiom to remember that no material or labor is cheap if it is not good; by keeping this constantly in view we can get higher efficiency and in the end save money. The question now naturally arises, What is good material? This I will endeavor to answer by describing each necessary part and specifying what should be required in each case. Successful toll line work is dependent on:

1. Clear enunciation on the part of the speaker.
2. A good transmitter.
3. A reliable battery.
4. A line having low resistance, low self-induction, low capacity, high insulation, and well balanced throughout.
5. A good bi-polar receiver.
6. Good hearing on the part of the user of the apparatus.

There is practically no limit to the length of a line over which talking is possible, provided the cost of building that line is not taken into consideration. By the use of the recent invention of Prof. Pupin, lines should be built in the future much more cheaply, and talking will certainly be conducted over greater distances than at present. Many years must elapse, however, before this invention becomes common property. The greatest drawback to long line talking is the constant disturbance through noises of all kinds coming from various sources,

such as leakage, induction, unbalanced conditions, atmospheric and electrical disturbance, etc., all of which must be diagnosed and treated separately. A perfectly balanced metallic circuit is a closed circuit of metal, with no earth connection whatever, and having equal conductivity and insulation resistance on each side of that circuit, both sides being equally exposed to any sources of disturbance; such a circuit is possible, and will produce the best results. In such a circuit, foreign induced currents will meet and counteract each other and, if no leakage exists, it is possible to have a quiet line. Such a line is very sensitive and will show at once any weak spots; for this reason I advocate keeping as far away as possible from all wires likely to produce induction, thus reducing the cost of maintenance and increasing efficiency. Even if the first cost be more, it will be found advantageous to avoid paralleling any wires other than your own; the standard transpositions will prevent cross-talk between these and will be explained later. On city connections there is generally no restriction as to the duration of a conversation, except possibly in the case of a party line, but with toll lines, all conversations are limited as to time and a fixed rate is charged for each conversation. This makes operating slow, because of the supervision necessary, and the number of lines attended to by one operator is reduced from 100 to 20, and on very busy lines to as few as 10. The calls for toll lines are usually recorded on a special ticket. (Figs. 1 and 2), which is carefully filled out and turned over to the checking clerk, who makes out the statement and then files the ticket for reference; the tickets are usually held one year, when they are destroyed. It is usual to stamp automatically, by means of a calculagraph, the date and the times of commencing and closing the conversation.

CENTRAL OFFICE EQUIPMENT.

Special apparatus is usually provided for toll line work, and primary (local) batteries are still universally used. The switch-board should be as simple as possible and nothing should be included in the circuit which will in any way interfere with the efficiency of talking. In most exchanges the toll-board is separate from the local board, and in some it is even in a separate room; trunks are provided between toll and main board. Sometimes the toll board forms a part of the main board, or has attached to it a section of the multiple board. In either case the order from the subscriber's (or A) operator is given over a call-wire connected to the toll (or B) operator; or, in large exchanges, to the recording operator. The operation is as follows: Subscriber calls operator and asks to be connected to

"Long distance;" operator presses the button marked "Toll" or "L. D.," giving the number of the subscriber; the assigning or toll operator calls up this number and gets name of party and line wanted, also name of party calling, and notes same on ticket; if the line is not "busy" she will put through the connection at once, but usually the subscriber is told he will be called as soon as they get the party wanted. The duty of the assigning or recording operator is to take all calls from subscribers' operators, get particulars of call, fill out the ticket and assign to the proper operator. All toll boards should be provided with two special sets of cords having a repeating coil in circuit, in addition to the regular cords, so as to be able to cut in a repeating coil on a noisy line when necessary; in some cases the repeating-coil is connected to a pair of jacks, but cords are better in many ways.

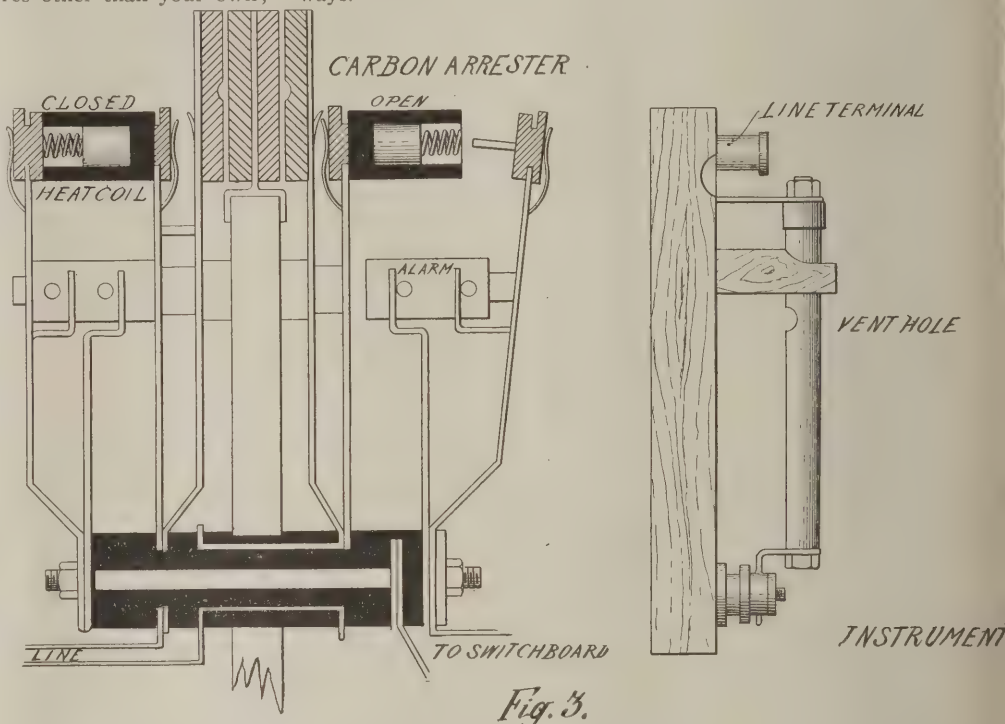


Fig. 3.

It is economy and good practice to place the very best operators obtainable at the toll board, as an active and intelligent operator, by saving time, can utilize the lines under her care to their fullest efficiency, and thereby obtain their highest earning capacity.

All toll lines should be brought into the box, at the end of the underground cable, with aerial wires, and not through the aerial cables, it being best to use as little cable as possible on the toll lines, and they should be protected at the outer cable end with a combination sneak current, fuse, and air-space protector. This is usually composed of a fuse wire, a heat coil and a set of carbons with mica (or silk) between them. These are made in various styles, but all serve the same purpose, namely, to protect the cable and exchange apparatus from the results of crosses with high potential circuits and from lightning (Fig. 3).

A RETROSPECTION AND A FORECAST

BY HARRY HUNT ROBINSON IN THE TELEPHONE GREENBOOK

WHAT will be the outcome of the telephone situation?" It is probable that in the telephone field no question is more frequently asked and less often answered than this. Upon the answer hang many millions of dollars. Put the question to a Bell man and he will tell you that the idea of Independent telephony is fundamentally wrong, that the rates charged are too low, that the Independent operators have no idea of costs and do not make sufficient allowance for maintenance and depreciation, and that but a short time will be required to demonstrate these facts both to the investor and to the public at large. Make the same inquiry of an Independent man and he will tell you that no monopoly of a public utility can succeed, that the American people will not consent to be oppressed by excessive charges, unsatisfactory service and discourteous treatment, and that for these reasons the days of the Bell are numbered. True it is that there are on both sides some few men who realize that the final outcome is

dependent neither upon theory nor sentiment, but rather upon brains and energy, which, working together, will sometime produce what is as yet little known, a nearly perfect telephone service. When that can be produced, the public will not stop to argue about either the principle or the cost, but will heartily support the company or system of companies that has it to sell. Many of the readers of this statement will class me with those who claim that "the telephone is in its infancy," but let all such withhold their verdict until they have heard me out. A perfect telephone service is not the product of equipment, of construction, of operating or of management, but the composite result of bringing all of these together, each in its most perfect form, and building therewith a great machine which, when oiled with dollars judiciously expended and fired by ability and energy, will give the required results.

It is the verdict of many that competition in the telephone field has been a good thing. So far my researches in the archives of

Nature's probate court have not brought to light the fact that the Bell Company is the heir to whom a monopoly of the telephone business has been bequeathed. What rights it may have had because of priority of invention were early dissipated by its failure to make proper use of those rights, and the Bell service of to-day, such as it is, is the product of competition. It is not the purpose of this article to arraign the American Bell Telephone Company for its sins of omission or commission during the period when, under the patent laws of this country, it enjoyed protection from competition. What it might have accomplished under a more liberal policy is a matter of theory; but what it did not accomplish is a matter of record.

The Independent movement was a child of necessity. Telephone users throughout the country, chafed by the burden of arbitrary prices and inferior service, waited only for the expiration of the basic patents to secure relief. The pioneers who came forward to offer this relief were handicapped by poor equipment, incompetent labor and the difficulty of securing capital to fight so powerful an organization as the Bell Company and its licensees were generally supposed to be. At first only rural lines and small exchanges were attempted; but, as these grew in numbers and the state of the art advanced, demand for an actual competitive service became so strong that it could no longer be denied. The territory of the monopoly was invaded; those who sowed the wind began to reap the whirlwind; but even at this period a broad policy on the part of the Bell Company would have saved the day. The Independent companies were scattered, their apparatus was inferior, and they were forced to battle daily with incompetent help and inexperienced management. Had the Bell Company come forward then with an offer to provide them with equipment and connect them with the Bell long-distance system under a sub-license arrangement, the day of reckoning could have been indefinitely postponed or altogether avoided. But it was a far cry from the small Western town to Boston, and the administration, blinded by its greatness, met every advance with arrogance and contempt. Such action was all that was needed. From that time up to the present day Independent telephony has grown and thrived until now at least 2,000,000 Independent telephones are in daily use, and scarcely a city or town except Boston, New York, Cincinnati and San Francisco but has an Independent exchange. And moreover, the Independent telephone exchange of to-day is no longer a product of slipshod construction and rattletrap equipment; but is representative of all that is best in the telephone art. In six years a greater result has been accomplished by the Independents under the most strenuous circumstances than the Bell Company had achieved in twenty years.

There have been, of course, many failures on both sides. The Southern Bell, Central Union, Iowa, Michigan, and Erie systems, all Bell sub-companies, have stood the brunt of competition; and none of these companies would be able to meet its debts and fixed charges to-day were it not for the fact that the depreciation account is slighted and the weight of the burden is carried by the parent company. The Harrison Telephone Company and a number of small strictly local companies represent the failures on the Independent side. But each of these has carried with it a lesson which has not been without profit, for capital has been made more wary and wild-catting has become impossible.

But what of the outcome? It would indeed require the gift of second sight to answer this question truthfully; but if the straws of precedent can be relied upon to forecast the future, we have a basis upon which to work. When the American Bell Telephone Company was first organized, a large number of licenses were granted, some covering several states and others but a single county or city. The licensee companies have gradually consolidated until to-day their number is less than at any other period of the company's history, although they operate nearly a million and a half subscribers. So it has been in the Independent field. The one hundred and six thousand Independent telephones in operation in Ohio to-day are owned by seventy per cent. of the number of companies, which, one year ago, were operating but 65,000 telephones. Taking these facts as a base, it is safe to assume that consolidation and absorption will eventually result in two great telephone systems, each under a single organization. This would seem from the facts at hand to be the only logical solution of the problem; but the man, or combination of men, on either side who can safely pilot these great organizations past the many obstacles to be met and overcome must adopt as a watchword, "The best telephone service for the greatest number at the lowest living price."

HOW THE INDEPENDENTS SUCCEEDED IN DAYTON, O.

THE Home Telephone Company, of Dayton, O., was organized about one year ago with an authorized capital of \$750,000. It succeeded the Dayton Home Telephone Company, which after a year or more of earnest effort had finally secured through the probate court of Montgomery County a franchise with practically the same provisions, rights and limitations embodied in the franchise granted to the Central Union Company.

The proposition of an Independent Company met with the usual hearty opposition from the Bell people and their subsidized friends and agents, but the public were favorably disposed toward the new enterprise, and from its inception the assurances of the success of the new company have been most promising. The Bell Company has tried to forestall the securing of contracts by the introduction of ten party lines and so vigorously has this scheme been pushed that probably more than half of their subscribers are connected on this basis. The effect has been highly beneficial to the Home Company in a double sense. They are educating the people to the use of the telephone and at the same time aggravating and disgusting them with poor service. As a result a very large number of these ten party-liners have subscribed for the telephones of the new organization, and more are coming each day.

No telephone proposition in the state has been so successful in securing a preliminary list of subscribers as this company. It has at the present time over 4,300, and it is confidently expected that 6,000 will have been secured by the time the exchange is in active operation.

Several distinctive features will be used in the construction of the plant, which is intended and expected to be one of the most modern equipped exchanges in the country. Incidentally it might be mentioned that the interests of the Federal Telephone Company were purchased by the increasing of the holdings of the local stockholders and the securing of additional new ones. All the preliminary and much of the construction work with reference to the installation has been accomplished and under the new organization the enterprise has assumed a purely local aspect.

The Independent telephone interests within a radius of 25 miles of Dayton have in the past few years assumed large proportions, and in Piqua, Troy, and Xenia the Bell Company has been supplanted in a large measure by the local organizations. These have been clamoring for an outlet into Dayton, which in connection with Hamilton on the south will form an impregnable bulwark for the Bell Company to fight against.

Dayton forms the key to the situation in Southwestern Ohio, and although no franchise has been secured as yet in Cincinnati, the enterprise here will in a large measure have a favorable bearing on the situation in that city. The development of the country adjacent to Dayton in Montgomery County will be looked after and a rural service established, which will meet the requirements of the country people. Public sentiment in Dayton is almost a unit in favor of the Home Company and its success is assured.—J. C. Reber, Cashier, the Winter's National Bank, in *Finance*.

A LIFE-LINE TELEPHONE.

THE latest special application of the telephone is to afford communication between a wrecked ship and a lee shore. The Philadelphia *Record* gives the following account of the method employed:

There is at present on exhibition in the Paris office of the French Life-Saving Society an ingenious life-saving kite, which is known as the Cerf-volant B. C. The initials stand for the name of Comte Brossard de Corbigny, the inventor of the kite.

The form of the kite is that familiar to all schoolboys, and it is claimed that it is much more serviceable aboard ship than any other description of life-saving apparatus. The wind that blows the ship ashore carries the kite inland, and when it is over the desired spot an ingenious manoeuvre brings the guide rope within reach of those on terra firma.

Communication being thus established between the ship and the shore, the greatest difficulty is overcome, and the rest is comparatively easy. A pocket in the kite contains a series of signals and accommodation for a message from the shipwrecked crew, and a receiver and transmitter for the establishing of telephonic communication are also attached. The invention of Comte Brossard de Corbigny has been tried with satisfactory results at Toulon and Brest, and an effort is being made to secure its adoption by the shipping of all nations.

CONTEMPORARY CROSS-TALK

WHEN the commercial and financial difficulties of a telephone plant are considered from the point of view expounded in our last talk, the extremely limited period out of each twenty-four hours during which the plant is actually at work earning money, it is easy to appreciate what a perplexing problem telephone rates are. In the extremely short duration of its actual daily work as a piece of machinery, in its insignificant "load factor," as engineers term it, the telephone plant probably stands alone among engineering enterprises. In its early days the central station electric lighting plant had the same difficulty to deal with, the supply being at first entirely for lighting purposes; the period of each day during which the plant was worked at full load was naturally very short. The growing use of electricity for power and heating, but principally, of course, for power, and the growing demand for electric light at all hours of the day owing to the dearth of natural light in many parts of modern office buildings have done wonders for the electric supply central station, so that from a very doubtful and difficult enterprise it has grown to be a highly satisfactory and remunerative one.

* * *

The telephone plant, however, has practically but a single application. Electricity supply can be used to light the arc or incandescent lamp, to turn any machine fitted with an electric motor, from a fan to a trolley car; to cook an omelet or to curl milady's dainty fringe. The gas plant has its by-products that make the sale of gas almost a secondary consideration. But the telephone plant is used solely for the exchange of telephone messages; it has no other applications and no by-products. And, taken in the aggregate, the average telephone plant is in active use as an earner for about one hour in every twenty-four.

This fact goes far to supply a reason for what the general public has always considered the dearth of telephone rates. When an hour's work a day has to pay for everything, that hour's

* * *

work must naturally pay pretty high. The same fact, coupled with another—that the public is rapidly acquiring the telephone habit and is beginning to use the telephone much more frequently than it formerly did—puts the last nail in the coffin of flat rates. While the aggregate work of the entire plant may be only an hour a day or less, the actual amount of work done by individual lines will vary very widely. Some lines will be in use for practically the entire working day every day, while others will not be used at all on many days and only a very little on others. A large proportion will be used about the average amount, eight or ten outgoing calls and eight or ten incoming calls, giving the line about an hour's work a day. Analyzing the work of a telephone plant in this way shows pretty clearly that flat rates are based on a wholly incorrect method of charging.

* * *

That the public generally is acquiring the telephone habit at a rapid rate, is using the telephone more frequently, more widely and for more varied purposes, has been evident for some time past. The manager who is tied to flat rates would naturally wish to repress this tendency, for, since he gets only a certain amount of money whether the plant does much work or little, his interest clearly is to have the plant do as little work as possible. Where message rates are the practice the manager's interest, on the contrary, is to encourage the use of the telephone in every possible manner, for every message means revenue and therefore profit, and every message increases the productiveness of the plant. As during the last few years the public has begun thoroughly to acquire the telephone habit, and there is daily evidence that the telephone habit is continuously spreading wider and taking a deeper hold, a great natural force has been set in motion which the flat rate manager will be powerless to stem or to evade, which will inevitably swamp him in due time, while it will simply make steadily and increasingly for the prosperity of the message-rate manager.

* * *

This is the help that is to come from without to enable the telephone manager to cope with the growing cost of furnishing telephone service. From within, as we have seen, he will depend on improvements in manufacture and in methods and, of course, on his own skill and science in administration to offset by economy in investment and costs the demand for increase in plant that will

occur as time goes on. From without he will be assisted by the gradual increase in the number of messages carried by each line that will naturally accompany the development of the telephone habit among the public at large. As each message pays its share of operating expense, it will obviously be to the interest of the telephone manager to get as many messages over every line as possible. If the average day's work of the average local telephone line now occupies that line for but a single hour there is obviously a large margin of spare time during which the line is now idle and wholly unprofitable that can be made profitable when every additional few minutes of use means revenue that helps to pay expenses and profits.

* * *

Therefore, while the real interest of the flat-rate manager—to put it bluntly—is to repress the development and use of the telephone, it is to the interest of the message-rate manager to spread the development of the telephone as much as possible, to have as many stations as he can possibly put out and to have every station used as many times a day as it possibly can be used consistent with a good general service. Of recent years there has arisen a strong demand for cheap telephone service, and many owners of telephone plants and many telephone managers have endeavored to meet this demand by making low flat rates. This implies the assumption that the average amount of service rendered will always remain the same, and, unfortunately, that is a fatally incorrect assumption. By "telephone service" is generally understood the amount of service that a telephone subscriber may require in the course of a year, since the yearly rate is generally quoted in connection with the phrase "telephone service." Now were that amount of service a fixed quantity, a flat annual rate would be fairly safe. If a contract to supply telephone service for a year meant something fixed and measurable, flat annual rate would be reasonable.

* * *

With telephone service supplied under a flat rate there is no measure, practically no fixed quantity, and nothing to go on—in short, but the assumption that the average amount of service demanded will be something or other and always about the same. When a flat-rate manager makes a contract with a new subscriber he has no means of knowing whether that subscriber will pay him a profit or not, whether he will use one, five, ten or a hundred calls a day. The only way he can make himself safe is by fixing so high a rate that only the few excessively busy lines will be unprofitable, and such a rate has the natural result of repressing the development of the telephone by putting it out of the reach of many who would use it at a lower rate. If he bases his rate on some estimate of the present average amount of use and fixes a low rate that will tempt a large number of subscribers he is simply planting a stake for the tide to overtake. With the growth of the system and the growth of the telephone habit he will sooner or later be called upon to furnish a larger amount of message miles than he is getting paid for, and then he must either go under or pull up his stake and recast his rates.

* * *

The message-rate manager, on the other hand, not only can regard with equanimity the increasing number of message miles he will be called upon to furnish, but is positively interested in encouraging that increase to the best of his ability. While, as we have shown, it is not easy for him to get paid for every mile, he is getting paid for every message, therefore the more messages the merrier. To take care of the miles, of the growing number of them that will appear in every message, he must look to gradual cheapening of plant, with all the savings in various items of expense that flow from a lower prime cost and improved quality, and there is every reason to believe that in this direction he will find an offset to the growing travel of the average message. He also has the satisfaction of knowing that each additional message a day over a given mile of wire increases the productiveness of that mile of wire and carries its own share of the burden of interest, maintenance and depreciation. And as each message pays its share of operating expense, general expense and so forth, what the message-rate manager wants and must work for is precisely what the flat-rate manager does not want—traffic, lots of traffic over every line.

The Listening-Key.

IN THE OPERATING FIELD

AN EPOCH IN INDEPENDENT PROGRESS

ONE of the most important connections between the companies in the Independent field has just been completed. The United States Telephone Company has finished its long distance line, connecting the Independent companies of the Middle West with West Virginia territory. The line in West Virginia connects with the exchange at Huntingdon and Charleston.

A feature of this new line is where it crosses the Ohio River at Ironton, O. Two immense towers, 90 feet high, were erected on either side of the river and a single span, containing ten phonoelectric wires of the most modern construction, are suspended from the towers.

The Michigan connections of the United States Company will be completed by Sept. 1, when the station at Toledo is completed. The company is now installing a long distance switchboard with a capacity of 60 toll lines. The completion of the Toledo plant will connect the Independent telephone interests of Ohio, Michigan, Indiana, Pennsylvania and West Virginia.

Statistics of the Independent interests in Ohio, Michigan, Indiana, Pennsylvania and West Virginia are to be incorporated in a state telephone directory which is now being prepared.

According to these figures there are in round numbers 106,000 Independent telephone subscribers in Ohio, 34,000 in the southern peninsula of Michigan, 65,000 in Indiana, 20,000 in the western part of Pennsylvania, and 12,000 in West Virginia.

At present the Independents have no connection with Eastern Pennsylvania. Lines are now being put through, however, from Philadelphia to Harrisburg, Johnstown and on to Pittsburg. Next year, by April 15, the United States Company expects to have its test station at Buffalo ready for operation. By means of this station the United States Company will reach every important center in New York State outside of New York City.

WESTERN PENNSYLVANIA COMPANIES TO MERGE

I. W. NESBITT, president of the West Penn Telephone Company, operating in Washington County, Pa., and T. B. Lee, the general superintendent of lines, are negotiating for the purchase of the Chartiers Telephone Company. This company's lines cover the western part of Allegheny County. The West Penn Company is at present establishing lines at Carnegie and putting in an exchange at West Middletown and its efforts will soon be turned to rearranging its lines in Washington in order to perfect the service.

THE INDEPENDENT COMPANY, OF GREELEY, COLO.

THE Greeley Independent Telephone Company, of Greeley, Colo., was organized August 1, 1900, with a capital stock of \$10,000. The incorporators were all prominent business men of Greeley and Weld County, who believed that they could best serve the city's and their own interests by establishing an institution of this kind, largely to enable business men to come in close communication with their ranches in the country, and also to furnish a better service locally.

So much business came to the new company right on the start that, instead of a small, local exchange, as planned, the company soon found 700 subscribers on its list. New instruments are now being installed at the rate of three a day, and there are fully 100 applications waiting to be filled.

It soon became evident that the small capital stock was insufficient to carry on the rapidly growing business of the company, and, under the name of The Northern Colorado Independent Telephone Company, composed of Greeley and Boulder men, a new organization was formed, with a capital stock of \$500,000. The officers chosen are D. E. Gray, president; J. A. Teagarden, vice-president; B. F. Johnson, treasurer; T. C. Williams, secretary; E. J. McMurray, general manager.

The directors of the company are: S. Q. Clark, Guy D. Duncan, G. F. Fonda, D. E. Gray, B. F. Johnson, E. J. McMurray, G. J. Spear, J. A. Teagarden, T. C. Williams.

The company has now under construction, with the Morgan County Company, sixty miles of copper toll line, connecting Brush and Fort Morgan with all the lines in Weld County. The work is being pushed with all possible speed, and soon all northern Colorado will be connected by this system.

TELEPHONE COMPANY NOT A COMMON CARRIER

JUDGE Brownlee, in the Circuit Court of Wabash, Ind., has rendered a decision of great importance to telephone interests everywhere. The Home Telephone Company, of Wabash, several years ago made a contract with the North Manchester Telephone Company, by which the Home Company was bound to give the North Manchester Company exclusive entrance to Wabash over its line from North Manchester. A year or more ago the Eel River Valley Telephone Company was organized at North Manchester, put in a \$20,000 system, built rural toll lines and got a fine clientele. It asked the Home Company for the privilege of doing its Wabash business over its wires, and the Home Company, willing to grant the right, was restrained by its exclusive contract with the North Manchester Company and was obliged to refuse the service.

The Eel River Valley Company appealed to the courts, insisting that the Home Company was a common carrier and bound to allow any other company to use its city lines at a satisfactory rate. An injunction was prayed preventing the Home Company from refusing Eel River business, but Judge Brownlee decides that the Home is not a common carrier; that its contract is a sacred one, and that it can handle North Manchester business only for the North Manchester Telephone Company so long as the contract is in force. In his ruling Judge Brownlee said that while an injunction would not lie, the law is on the side of the Eel River Company, but the State should be made a party to the suit and a mandate applied for compelling the Home Company to furnish service to both the Manchester companies on identical terms.

A MINNESOTA LINEMAN ACCIDENT DECISION

IN a suit of a telephone company against the Maryland Casualty Company, the Minnesota Supreme Court has rendered a decision, in which it holds that the accident company is not liable under the policy unless it is at once notified of the accident. This decision is worthy of note. In the case in question an employee of the telephone company met with an accident. The telephone company failed to give any notice to the insurance company from which it had secured its liability policy. A year later the employee sued the telephone company and received a judgment for \$750. The telephone company then demanded payment from the casualty company and got a verdict against itself.—*News Letter*, San Francisco.

UP-TO-DATE SERVICE FOR WOOSTER, OHIO

THE Millersburg, Wooster and Orrville Telephone Company's lines in Wooster, O., and vicinity are being entirely rebuilt. Twenty thousand feet of new cable will be used inside the city of Wooster alone. The cable used will be in four sizes—100 pair cable, 50 pair cable and 25 pair cable. Every up-to-date improvement in the construction of a modern telephone service will be inaugurated and put in use by the company.

VALLEY TELEPHONE COMPANY WILL MAKE IMPROVEMENTS

O. M. BAKE, of Hamilton, O., president, and W. G. Thompson, of Lebanon, manager of the Valley Telephone Company, and other stockholders of that company, met in Hamilton, O., recently to discuss developments and improvements of that line. It was decided to at once commence the improvement of the service at Lebanon by making all the circuits full metallic. Other improvements there and at other points of the state on Independent lines were agreed upon.

"The Independent telephone companies have the State of Ohio covered with a network of lines," said Manager Thompson. "We have about every important point in the state covered excepting Cincinnati. We are getting ready to invade this city, and when we have our arrangements completed nothing can prevent our entry into the Queen City. That we will have an Independent line in operation there is as certain as day will follow night.—*News*, Hamilton, O.

Opinion and Comment

FORECASTS

THE telephone business is a business of boundless possibilities and in any industry with so wide a horizon there will always be many men to indulge in prophecies and to make forecasts as to the future course of events. Mr. Harry Hunt Robinson, whose interesting article in the *Telephone Green Book* we reprint on another page, thinks that the eventual outcome of the present telephone situation will be the consolidation and absorption of the various telephone companies now operating throughout the United States, into two great telephone systems, each under a single organization. The leaders who are to accomplish this consolidation must, according to Mr. Robinson, adopt as their watchword, "The best telephone service for the greatest number at the lowest living price."

That is an excellent watchword for any telephone man to adopt, whether he contemplate consolidation, absorption, competition, or just the making of the best living he can make out of his business. But to interpret and define Mr. Robinson's watchword or text would lead one into a disquisition that might fill volumes—several of retrospect and a few of forecast. Who is going to say what is the "best" telephone service? Is it the most rapid service, the service that gives the best talking, the service that reaches the largest number, or the service that gives the greatest variety of facilities? As to "the greatest number" we are far yet from knowing what is the greatest number to whom telephone service can be supplied. In any locality there will always be some people who will never use the telephone service, but how many there are who will use it, when it is good enough and cheap enough, can only be guessed at. As to the "lowest living price," the definition of that alluring phrase is the riddle of the telephone business.

In common with Mr. Robinson we decline to be classed with those who claim that "the telephone is in its infancy," but we do hold that it is in its early youth with the major part of its possibilities yet before it. It is a youth of brilliant promise and remarkable achievement, but its real career is only just beginning and it is far yet from having reached the prime of life when the scope of its career as an industry can be fairly surveyed. The telephone is the most wonderful invention that was ever made and the future that lies before it is rich with possibilities that have yet hardly been hinted at. The conditions of the telephone business are changing from day to day and every day the telephone is taking a wider and a firmer hold upon the people. In aiming to give the best service to the greatest number at the lowest living price telephone managers have a group of problems whose solution will give them many years of work before they need contemplate consolidating themselves into one great organization.

The era of telephone expansion that set in a few years ago has apparently no limits. Every telephone that is put out educates users of other telephones to follow. The whole world to-day lives by communication, and in methods of communication it is the telephone first and the rest nowhere. The little machine that carries the human voice a hundred feet or a thousand miles with equal fidelity and celerity is the first of all carriers. The services it can render are far beyond those which it is made to render to-

day. Expand its utility, correct its defects, keep it always accurate, speedy and reliable, and give it to the public at a price which the public will pay and will pay you a profit—and you will have work for many days to come so absorbing that the final outcome will occupy your meditations not at all.

PROTECTORS

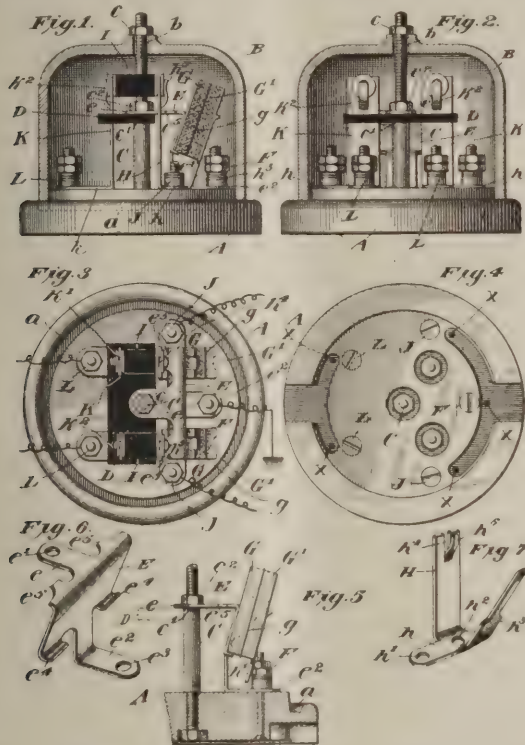
ILLUSTRATIVE of the refinements with which the telephonic art is surrounding itself and of the necessity for scrupulous attention to detail in every part of the complicated equipment of a modern telephone system are the three patents granted to Mr. F. B. Cook, on protectors, which are abstracted in our Patent column this week. The protection of telephone apparatus from foreign currents is no simple matter, as a whole family of mischief-working invaders, from the rending lightning discharge to the insidious "sneak" current has to be guarded against, and unless an efficient guard is set and constantly maintained the penalty sooner or later may be the destruction of an exchange by a fire started in its very vitals. Nowhere else is eternal vigilance so truly the price of safety.

Between the two extremes of the lightning discharge that may have millions of horse-power behind it and the "sneak" current of a fraction of an ampere, which is capable of storing up enough heat in a relay or bell coil to set the covering on fire, there are legions of foreign currents of various origins and strengths that would do damage to some part of a telephone plant if they got beyond a certain point. In guarding against all these various dangers a system of protecting telephone circuits has been worked out which provides for practically every possibility. The junction between the overhead wire and the underground cable or inside wiring is protected by a fuse which prevents a very heavy current capable of damaging the cable, from passing that point. At a point between the inside wiring and the apparatus, at both ends of the line, are placed a lightning arrester to carry off high tension discharges and a heat-coil to ground the line when it becomes the path of a steady "sneak" current. Thus every contingency is provided for, and if all the protectors are properly kept up a telephone system so equipped is safe from the fire risks of its own lines.

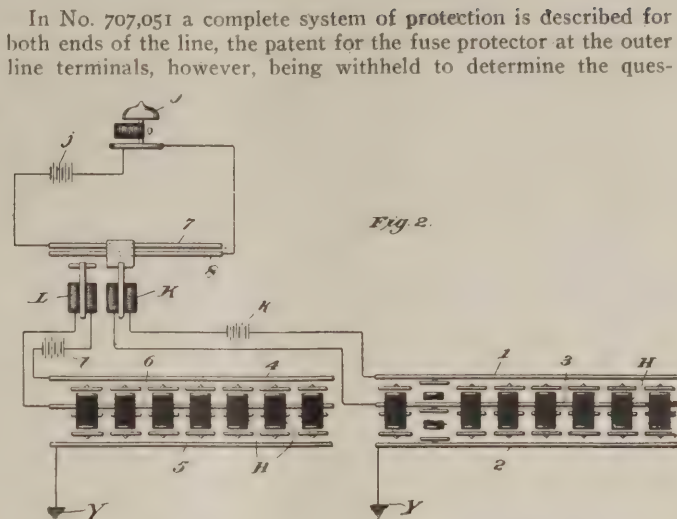
The patents referred to above show how the various protective devices have been improved in detail, made into compact and complete appliances, assembled into the orderly array and equipped with the automatic time-saving methods that are the distinguishing features of modern telephone work. The telephone man of to-day is not content, when a protector blows out, to receive notice of that fact through a trouble report some hours later. The protector itself must automatically give the alarm and automatically indicate its position among the hundreds or thousands of similar devices in the exchange. This refinement will effect an important saving of time in restoring interrupted lines to service, and since the prime function of the telephone is the saving of time it is a fine illustration of the way in which the telephonic man is constantly putting wheels within wheels, and making all parts of his plant work accurately, efficiently and automatically.

Patents

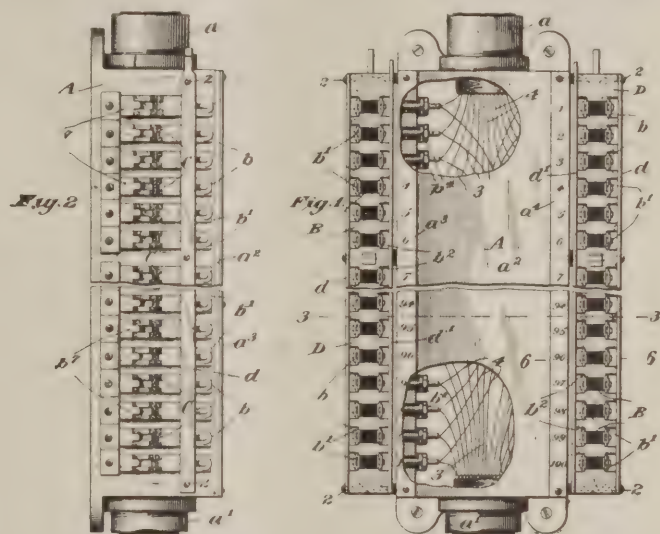
To Frank B. Cook, of Chicago, are issued three patents on protectors (Nos. 707,049, 707,050, and 707,051, all dated August 12, 1902), covering an electrical protector set, a system of strong current protection and a terminal box for protected electrical circuits. In No. 707,050, the object of the invention is to provide a simple and comparatively inexpensive construction whereby a plurality of electrical protectors may be combined and efficiently em-



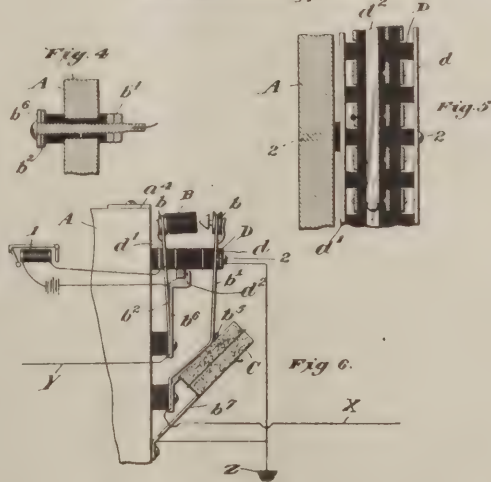
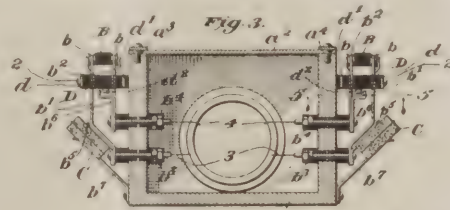
ployed in a compact and easily accessible structure. The drawings show clearly how effectively this object has been accomplished and need but little description. The protectors are mounted on a porcelain base A and are enclosed by a glass dome B, clamped to the central post C by the nut c. The plate E, the special form of which is shown in Fig. 6, is the ground plate of the arrester and on its shoulders e⁴ carries the carbons G of the lightning ar-



tion of interference. At the central office the protectors are arranged in banks or sections and a system of signals gives a general



alarm at the operation of any protector and also indicates in which bank or section the burned out protector belongs. Referring



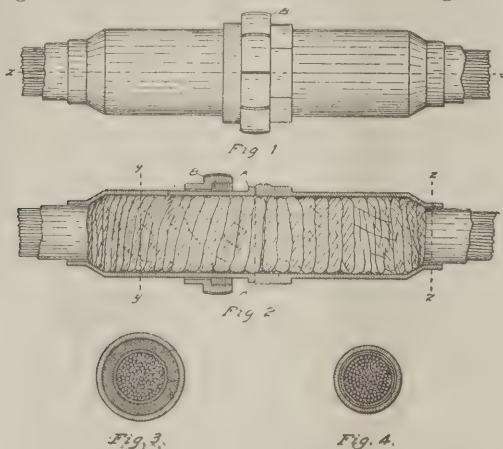
rester. The G¹ carbons are held by the arms h⁸ of the plates H, shown in detail in Fig. 7, and the two carbons are separated by a sheet of silk g. The ears e⁵ of E serve as ground contacts for the springs H of the heat coil I. When I is blown H flies outward and grounds the line by making contact with e⁵.

to Fig. 1, it will be seen that the protective devices are the same as those described in the previous patent, with the exception of the

line-fuse C, which, being in interference, is not described. At the exchange end the spring h^1 , which is released by the burning of the heat-coil H, closes contacts h^2 and h^3 of the circuit, including the indicator I and the battery h^4 . By means of relay contacts i^1 the circuit of the alarm bell J is closed whenever I is energized, so that a general alarm as well as a special signal is given when a protector is blown out. Fig. 2 is a diagrammatic illustration of the arrangement of the protectors in banks, two banks being shown each having its special indicator L and K, all the indicators having contacts to close circuit of the general alarm J.

In No. 707,049 the same system of protection is applied to a cable terminal, the protectors being mounted on the side of the terminal box in the usual manner and provided with special contacts governing indicator circuits that an alarm may be given and a signal set when a protector has been operated. The springs carrying the heat coils B pass through a slotted strip of insulating material D, carrying ground strip d and signal-circuit contact-strips d^1 and d^2 . When the heat-coil B operates the two springs b are allowed to separate, the outer one grounding the line by making contact with strip d (Fig. 6) and the inner one by means of bent spring b^1 closing contacts d^1 and d^2 and thus completing the circuit of the signal I. Figs. 3, 4 and 5 show clearly the arrangement of the protectors in relation to the ground-strips and signal-circuit contact strips, and Figs. 1 and 2 show the general arrangement of the terminal box and mounting of the protectors.

Thomas P. Jones, of Olyphant, Pa., patents (No. 706,567, August 12, 1902) a telephone cable connection, consisting of a screw union for which it is claimed that it provides a rapid method of connecting telephone cables, affords facilities for repairing wires where connected, makes a more rigid and durable connection than the method commonly used, and allows of disconnecting the cable when desired. The drawings fully illus-

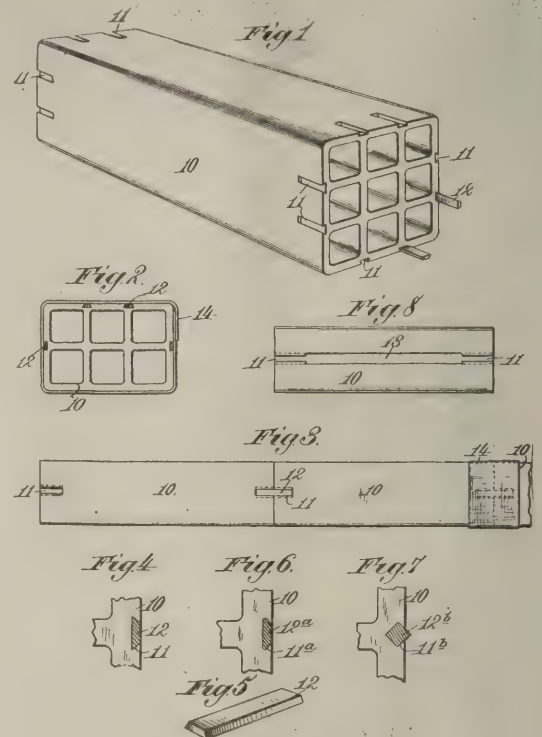


trate the device, Fig. 1 being an elevation of the completed joint, Fig. 2 a section on the line XX, Fig. 3 a section on the line YY and Fig. 4 a section on the line ZZ. The joint consists of two tubes with abutting collars, one collar being threaded and the other tube having a nut B for screwing the two parts of the union together. The cable is wrapped with waterproof paper or other covering of sufficient quantity to completely fill the space within the body part of the union, when the nut B is screwed home, compressing the covering and making an airtight joint.

Robert W. Lyle, of Perth Amboy, N. J., patents (No. 706,974, August 12, 1902) a conduit for electric wires in which the improvement consists in simple and highly efficient means for locking and aligning the respective sections of such conduit. The drawings show (Fig. 1) a perspective view of a section of conduit embodying the invention; Fig. 2 a modified form, in section; Fig. 3, a side elevation of a conduit, showing the sections thereof in alignment and an envelope about one of the joints between the sections thereof; Fig. 4 a sectional elevation of a key and its seat; Fig. 5 a perspective view of the key; Figs. 6 and 7, views corresponding with Fig. 4, but show different forms of key and groove, and Fig. 8 a side elevation of a different form of section.

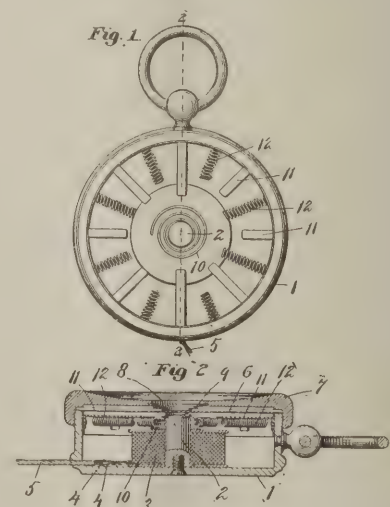
The improvement consists in the use, instead of the customary dowel-pins, of grooves on the sides of the conduits, the grooves having undercut sides so as to fit and retain the specially shaped key shown in Fig. 5. The grooves may be on all four sides of the conduit, or on three only, as in Fig. 2. In laying the conduits the keys, 12, are first inserted in the grooves 11 in one of the sections thereof and the abutting section is brought with its end in proximity to the first section and the free ends of the keys are introduced into the grooves of the second section and the two

parts are then moved into contact, each key being seated for about half its length in registering grooves in the engaging ends of the respective sections and its ends abutting against the closed ends of such registering grooves. The keys may be of any suitable material and shape so that the undercut side walls of the



groove are preserved. As shown in Fig. 8 the grooves at the ends of the section may be connected by a channel 13 with straight walls, so that a key can be slipped in the channel and slid in either direction into one of the end grooves. In this way the conduit sections can be first placed end to end and the keys afterwards put in, but means will be necessary to hold the keys against the longitudinal movement, which is not necessary with the other form.

Lemuel Mellett, of Somerville, Mass., patents (No. 707,441, August 19, 1902) a telephone receiver claimed to have improved power and sensitiveness. The instrument has a cup-shaped steel casing 1, carrying magnet core 2, the periphery of 1, on which the diaphragm rests, constituting one pole of the magnet. The diaphragm 6 rests on 1, but is not clamped tightly to it by the cover 7. Two conical coiled springs 9 and 10 bear on the center of the diaphragm from opposite sides, the base of the lower spring resting on the coil and that of the upper against



the case 7, so that the diaphragm is spring balanced or suspended opposite the magnet pole. This arrangement allows of a very thin diaphragm adapted to vibrate freely. In the space behind the diaphragm are located harmonic vibrators 11, 12, secured at one end to the casing 1. These vibrators are of different lengths so as to emit different fundamental tones. The idea is that they will vibrate sympathetically with the diaphragm, reinforcing its vibrations and increasing the loudness thereof.



New Companies

JACKSONVILLE, FLA.—Application for a charter will be made on October 1 by the incorporators of the Southern States Telephone and Telegraph Company, with headquarters in Jacksonville. The names on the application will be W. S. West, J. W. Barwick, M. E. Gillette and W. M. Bostwick, Jr., and the authorized capital stock will be \$500,000. The purposes of the company shown by the announcement made in advance, is to build and operate telephone and telegraph lines in the State of Florida. It is stated that the company will build lines from Jacksonville to Fernandina, to Pensacola, to Miami and Punta Rassa, with many stations intervening.

AMBOY, IND.—The Amboy Home Telephone Company has been incorporated with a capital stock of \$5,000.

COWAN, IND.—The Cowan Rural Telephone Company has been incorporated. Capital stock, \$4,000. Directors—Abraham McConnell, Charles Springer, George W. Kabrick, Philip Turner, William Clark, Lester H. Painter, Wesley B. Harbaugh and P. Perry Turner.

LONE TREE, IA.—The Lone Tree Telephone Company has been incorporated with a capital stock of \$5,000; G. L. Day, J. M. Lee and others are the incorporators.

ST. PAUL, MINN.—Articles of incorporation have been filed here for the Scott Grain and Telephone Company; capital stock \$15,000. Incorporators: James Scott, of Argyle; Sara McNulty and Francis W. Sullivan, of Duluth.

CONEHATTA, MISS.—The Conehatta Telephone Company has been incorporated with a capital stock of \$500. Incorporators: Floyd Loper, J. G. Brinson, A. B. Amis, J. B. Bailey, A. G. Petty, W. J. Day.

OXFORD, MISS.—Oxford will, in the very near future, have a new telephone system. The promoters have \$2,500 already subscribed, and will ask for a franchise from the city. This is a result of the Bell Telephone Company raising its rates. As a result fifty people ordered its telephones out of their residences and business houses.

CALLAWAY, NEB.—The Callaway Telephone Company, which was organized a little over a year ago, but which, owing to the big fire, was disbanded, has been reorganized by the election of Isaac Selby president, J. W. Wieland, secretary, and Ira C. McConnell, treasurer. The company has already purchased a one hundred drop switchboard, and a local exchange will be put in at once, which will also be connected with all toll lines running into Callaway.

COZAD, NEB.—The Farmers' and Merchants' Telephone Company has been incorporated with headquarters at Cozad. The capital stock is \$2,000, and the incorporators are John Anderson, William G. Anderson, Peter Kinnon, Thomas Walker, Daniel Phillips and George M. Campbell. The company was formed to operate a line from Cozad to Eustis with branch lines.

EUSTIS, NEB.—The Farmers' Mutual Telephone Company, of Eustis, Frontier County, has been incorporated. The company is capitalized at \$20,000. Its incorporators are: John D. Anderson, William Walker, William G. Anderson, Daniel Phillips, Peter Kennan and George M. Campbell.

CHARLOTTEVILLE, N. Y.—The Charlotte Valley Telephone Company has been incorporated with a capital stock of \$650, to operate a telephone line in South Worcester, Otsego County; Summit, Charlotteville and Lutherville, Schoharie County. The directors are George Oliver, Maleatus Bruce, Richard Jeffers, Leslie D. Smith, Levi M. Stevens, Hiram D. Haver, William Craspe, Peleg S. Taber, Nicholas Van Patten, of Charlotteville, and Arthur Heller, of South Worcester.

CRESTLINE, O.—The Crestline Local Telephone Company, with a capital stock of \$50,000, has been incorporated by Jacob Brobst, Charles E. Shiner, J. F. Laning, J. F. Morkel and A. H. Kinsey.

ROCKFORD, O.—The Rockford Toll Line and Telephone Company has been incorporated with a capital stock of \$10,000, to operate in Mercer, Darke, Auglaize and Van Wert counties.

SAYRE, O. T.—The Western Telephone Extension Company, of Sayre, has been incorporated for a term of twenty years, to do a general telephone business. The capital stock is \$40,000. The incorporators are G. A. Patterson, W. R. Roach, J. G. Rees, C. J. W. Adair.

WESTFORD, PA.—The Westford Independent Telephone Company, of Westford, Crawford County, has been incorporated with a capital stock of \$1,350.

CHESTERFIELD, S. C.—The Chesterfield Telephone Company, of Chesterfield, has been incorporated, capitalized at \$3,000. The officers are J. A. Welsh, president, D. T. Teal, vice-president, and I. P. Mangum, secretary and treasurer.

ST. MATTHEWS, S. C.—The St. Matthews Telephone Company has been incorporated with a capital stock of \$1,500. The officers are: H. A. Raysor, president; Shep Pearlstine, vice-president, and A. M. Able, secretary and treasurer.

NASHVILLE, TENN.—The Tennessee District Telephone Company has filed articles of incorporation. The capital stock is \$100,000. The corporation is composed of Shelby County men. The incorporators are E. Howard, J. Compton, W. T. Gentry, James Merrihew and George H. Fearons.

COOPER, TEX.—The Texas Long Distance Telephone Company, of Cooper, Delta County, has been incorporated with a capital stock of \$25,000. Purpose is to maintain a telephone system in Delta and other North Texas counties. The incorporators are J. H. Gordon, James Patton, J. F. Henslee and R. M. Walker.

ITASKA, TEX.—The Citizens' Telephone Company, of Itaska, has been incorporated with a capital stock of \$10,000. The incorporators are P. R. Stephens, L. E. Kerr, W. M. Buchanan and others.

Legal

SAN FRANCISCO, CAL.—City Attorney Lane has commenced five suits in the name of the city and county of San Francisco against the Pacific Telephone and Telegraph Company to enforce payment of the license tax on the company's nickel-in-the-slot boxes. An ordinance, adopted by the Board of Supervisors in 1898, provides for a license of \$2 per quarter for each nickel-in-the-slot machine that is used for any purpose. For the quarter beginning July 8, 1899, \$30,000 is wanted from the telephone company, and for the succeeding four quarters \$30,500, \$31,000, \$31,500 and \$32,000. The validity of the ordinance, as well as its application to telephone boxes, have been questioned in other suits which are pending in the Superior Court. The complaints in the five suits begun yesterday are signed by Tax Collector Smith, whose duty it is to collect licenses.

Elections

COVENTRY, N. Y.—A telephone meeting has been held here for the purpose of electing new officers on the South Coventry and Page Brook lines. The following were chosen: President, W. H. Spencer; directors, S. L. Fletcher, Edgar Waters; secretary and treasurer, C. D. Hungerford.

COLUMBIA, PA.—The Board of Directors of the Columbia Telephone Company has elected the following officers: President and manager, Harry C. Young; secretary and treasurer, Dr. W. G. Taylor; superintendent, Harry W. Johnson; bookkeeper, Joseph Kob.

YANKTON, S. D.—The stockholders of the Yankton Telephone Company have elected officers as follows: President, Fred Schnauber; vice-president, C. H. Dillon; secretary, Frank Van Tassel; treasurer, W. H. Edmunds. The following were chosen directors: Fred Schnauber, C. H. Dillon, W. H. Edmunds, Frank Van Tassel and G. W. Roberts. The new company will make arrangements at once to install a plant, and more stock will be put in by Yankton citizens.

YORKTOWN, VA.—The stockholders of the Chesapeake Telephone Company held their annual meeting at Yorktown. The following officers were elected: E. T. Lee, of Warwick County, president; J. W. Clements, of York County, vice-president; Hugh S. Bird, of Williamsburg, secretary; E. W. Warburton, treasurer. The directors are the above named gentlemen and Messrs. S. R. Curtis, J. J. Whispel, J. E. Crockett and E. E. Slaughter. Reports showed the affairs of the company to be in first class shape.

Franchises

COFFEEN, ILL.—The People's Mutual Telephone Company, of Mont-

THE WEEK'S MESSAGES *Continued*

gomery County, has been granted a twenty-five year franchise to control and operate a telephone system in Coffeen. The telephone company by the terms of the franchise is to have its line in operation within six months, and is to allow the village use of the line at one-half the regular rates. It will be allowed to extend its line from Hillsboro to Coffeen without delay.

WABASH, IND.—The board of county commissioners has granted a franchise to the North Manchester Telephone Company to build and maintain telephone lines throughout Wabash County.

CHATHAM, N. Y.—A. B. Howes, president of the Chatham and Canaan Co-operative Telephone Company, has asked the Board of Trustees to grant a franchise for the erection of poles and wires from the corporation line to the central office of the Chatham Co-operative Telephone Company. The Board adopted a resolution granting the franchise for a period of 20 years.

LIMA, N. Y.—The village board of trustees has granted a franchise to the Inter-Ocean Telephone and Telegraph Company to put in a telephone system. Work must begin within six months, and the system to be completed within nine months or the franchise will become void.

BRIDGETON, N. J.—The Bridgeton City Council has given the Interstate Telephone Company a perpetual franchise with the exclusive right to lay conduits under the streets for its wires. The company will at once proceed to spend \$20,000 in a new plant.

GLASSBORO, N. J.—The Interstate Telephone Company has secured a franchise to construct and operate telephone lines in Monroe Township, Gloucester County.

CORSICANA, TEX.—The county commissioners' court has granted Mayor Call a franchise to build a telephone line from Corsicana to his farm near Dresden. The line will go by way of Drane, and branch lines will be extended from the western terminus.

GEORGETOWN, TEX.—The city council has refused the application from the Southwestern Telephone Company for a franchise for local telephone connection at this place. The Lone Star Long Distance Telephone Company is now in operation here, with local connection, and is proving very satisfactory.

SALT LAKE CITY, UTAH.—The Board of County Commissioners has granted the Telluride Power Company a franchise authorizing it to construct and operate a telephone company in Salt Lake County. The consideration for the franchise is that the company will give the county telephone service at 40 per cent. of the rates charged the public. The county also reserves the right to place cross-arms on the company's poles and to string two wires thereon for the purpose of establishing a telephone service for the use of the county exclusively.

Competition

MISHAWAKA, IND.—Despite the strong opposition and the efforts made to cause councilmen to refuse to vote for the granting of a franchise to the Home Telephone Company, the ordinance has been passed. The Bell Company at once announced a reduction in rates to residences of \$3 and \$5 per year. Business service is also to be cheaper.

SPRINGFIELD, MO.—Manager Juvenal, of the Home Telephone Company is here endeavoring to stir up interest in the proposed new telephone system which is to be established here. Stock to the amount of \$12,000 has already been taken. The new company when established will prove a very formidable competitor to the Central Union.

Combinations

WASHINGTON, ARK.—The telephone exchange at Columbus has been sold by Dr. Peeples to J. Y. Williams and W. S. Eakin, of Washington. An exchange will be put in at Washington, and the two exchanges will be conducted under the management of the Nashville Telephone Company.

LOUISIANA, MO.—The Louisiana Telephone Company has purchased the Vandalia telephone system, and will put in a modern and up-to-date telephone exchange. The country lines will be improved and everything put in first class order for a perfect service.

HUNTSVILLE, TEX.—The telephone exchange here has changed hands, the proprietor, Fred B. Robinson, leasing to A. B. Foster. Numerous improvements are to be made and the service extended.

Underground

RACINE, WIS.—The Citizens' Telephone Company has a large force of men at work laying the first length of the 2,000 feet of new underground cable. The company is investing over \$3,000 in extending its lines in the south part of the city.

Construction

ORLANDO, FLA.—A telephone line is to be erected from Smithville to

this place. Work will be commenced at an early day. The line will doubtless include Pinecastle.

APPLING, GA.—The telephone connecting Appling with Grovetown will soon be finished. Other lines are being projected. In a short time the county will be well supplied with telephones.

DEXTER, ILL.—The Wabash Valley Telephone line now connects Effingham and Dexter. Connection with the Munday line which connects all the towns in the west half of the county with Effingham, will be completed to Dexter soon.

HARDIN, ILL.—The directors of the Calhoun County Telephone Company held a meeting here, at which steps were taken toward extending the Calhoun line to St. Louis via Grafton.

LARCHLAND, ILL.—A new telephone line is being put in by the Rural Telephone Construction Company, an Independent organization composed of some of the officers of the Monmouth Telephone Company. This construction company has just completed a switchboard at Larchland, and 35 or 40 subscribers are now connected with it. A through toll line also connects the Larchland and Monmouth exchanges.

MT. VERNON, ILL.—Charles T. Judd, Jarvis Pearce and W. A. Willis, directors of the Tricounty Telephone Company, have made arrangements for entering this city with their line. The line covers 800 miles of territory, being operated in the counties of Jefferson, Franklin and Perry. The capital stock of the company has been increased to \$25,000.

LOCKPORT, IND.—The Monticello Telephone Company has begun the construction of a line to Lockport.

MUNCIE, IND.—The Delaware and Madison County Telephone Company now has nearly 1,150 subscribers. Houses and stores have been wired for 850 telephone instruments, leaving but 300 more to wire. The company expects to be in complete operation about October 15. The wiring of the houses is continuing, and this work will soon be completed.

RIVERSIDE, IND.—A line of telephone poles has been erected from Williamsport to this place. It would be a toll line with connections at Star City. The company will use the Lafayette Telephone Company's poles from here to the city.

VINCENNES, IND.—The Home Telephone Company is rapidly completing the construction work of its system. Nearly all of the conduits, of which there are several miles, are in place, and the majority of the poles required are erected. The list of subscribers already secured in this city is over 600, exceeding the Central Union Company's list by about 200. The Home Company is daily adding names to this list.

ANAMOSA, IA.—The Jones County Telephone Company, which has been doing business in Anamosa now about six months, will soon commence the construction of a copper metallic line that will extend from Monticello to Cedar Rapids, and at the latter point will connect with other metallic lines to western and southwestern parts of the State. The materials for the new line have been ordered, and it is expected that the enterprise will be completed within a month. They will also have copper metallic connection in a short time east to Dubuque and down the river to Clinton, Davenport, Rock Island, Moline and other points. The Jones County Company has absorbed the Bishop lines, which gives it a large scope of country north and northwest. The actual number of telephones connected with the central in Anamosa at present is 244. It is continually building farmers' lines tributary to its line all over the county. They reach every town in Jones County, with the exception of Martelle and Morley, and undoubtedly these places will soon be on the list.

OGDEN, IA.—The Ogden Telephone Company is constructing another rural line in Amaqua township, which will make thirteen farmer lines from the Ogden station.

WICHITA, KANS.—The Jones & Winters Construction Company, which is building the telephone line for the Wichita Telephone Company, has completed the new system. About 800 telephones are now in operation. The company has 1,100 subscribers, and the rest will be placed on the circuit as rapidly as possible. The Wichita Telephone Company, by the terms of its franchise, has until October 1 to get its system in operation, but it has been pushing its work rapidly. The officers of the company believe that as soon as the lines are in operation many more people will subscribe. It is expected to have 1,200 telephones working on October 1. The Wichita Company will connect with long distance telephone companies, and in a short time will have a good system of long distance connections in Oklahoma and Kansas. The Oklahoma & Kansas Telephone Company has already floated a loan of \$15,000 to build a line from Caldwell to Wichita.

CLOVERPORT, KY.—The Home Telephone which is building lines between Louisville and Owensboro, is progressing rapidly with the work, and has a large force of men in this county.

FLEMINGSBURG, KY.—Another telephone line has been completed, connecting this city with the place of C. M. Fleming, in the county. Nearly all points in the county are now connected with Flemingsburg, and there is at present a movement on foot to establish a trunk line between here and Maysville, as the present line contains so many subscribers that it does not work satisfactorily.

THE WEEK'S MESSAGES Continued

NEW GLOUCESTER, ME.—The Pine Tree Telephone Company is extending its line direct from New Gloucester to Gray.

PHILLIPS, NEB.—As soon as the telephone poles arrive work on the completion of the rural telephone line will be pushed. When completed Phillips, Giltner, Stockam and Aurora will have communication.

MORRIS, N. Y.—A project is on foot with prospects of success for extending the Farmers' Telephone line from the terminus at Turtle Lake, to Pecktown, thence to Edmeston and on to New Berlin. Many farmers along the route have subscribed for telephones.

SALAMANCA, N. Y.—A large force of men are now employed by the Independent Telephone Company setting poles on the line which will connect with Steamburg. The work is progressing rapidly, and it is expected the wire will be up in a short time. The Randolph Exchange has a line into Steamburg and when the one from Salamanca to Steamburg is completed it will give people here connection with Randolph.

NEWARK, O.—W. H. Crumb, of Chicago, is here with a force of twenty men and has begun working on reconstructing the Independent telephone plant. The men have begun to set new poles. The contract provides for new poles, new wires and cables and a complete new office equipment with new telephones of the central energy type for each subscriber. The work is to cost between \$40,000 and \$50,000.

PIQUA, O.—The Home Telephone Company is improving its service between Troy and Covington by constructing a new direct line from the former to the latter place. Another line to Piqua is talked of to provide for the large amount of business between the county seat and the Border City.

XENIA, O.—The Citizens' Telephone Company is about to make a radical improvement on its line to Yellow Springs. The line is now occupying the same poles as the trolley and the service is much impaired by the constant buzzing caused by induction. The company will construct a new line on the other side of the pike, using its own poles.

FOREST CITY, PA.—S. S. Jones, George S. Dunn and General Manager Hughes, of the Lackawanna Telephone Company, were in Forest City in the interest of the Anthracite Telephone Company which seeks a franchise in the borough. The line now extends from Scranton to Dundaff. They expect to have connection with the Lackawanna line which extends from Carbondale to Wilkesbarre. Service to Carbondale will probably be free and the rate to Scranton will be ten cents. The Anthracite Company now has a number of subscribers between Carbondale and Dundaff.

JOHNSTOWN, PA.—The Cumberland Valley Telephone Company has about thirty men at work on the construction of its new line to Campbells-town. It has been granted a franchise in Hummelstown, and will commence work there soon.

PUNXSUTAWNEY, PA.—The Farmers' Telephone Company held a meeting at Punxsutawney and decided to establish a central here. The system is rapidly becoming complete in the county and it is expected that Indiana will soon be roused and a central established there. So successful has the venture been that extensions may be made to Armstrong, Jefferson, Clarion, Clearfield, Elk, and Forest counties. A. S. McQuilkin is president.

WILMINGTON, S. C.—E. A. Perry, secretary and treasurer of the Columbus Telephone Company, was here recently, having been in Southport, where he went in the interest of the new line which his company is soon to extend to that place. Mr. Perry says that in Southport all the money has been subscribed necessary to the building of the connection and work will commence at once. The poles for the new line are already at Navassa, and as the line is to be built from that point they will be distributed along the route very quickly.

LA CONNER, WASH.—Another telephone line across the Beaver marsh to La Conner and one from Avon to Mt. Vernon are being constructed and will be in working order in the next thirty days.

WAITSBURG, WASH.—What will probably be the biggest barb wire telephone system in the Inland Empire will be put in operation soon, if a plan now proposed is carried out. The intention is to unite all the barb wire systems running into Dayton, Huntsville and Waitsburg by a central office here. There is already a central in Dayton, connecting several systems. To the Waitsburg central will be connected all lines running into that town and into Huntsville. The Dayton central will handle its own systems, as at present, and the two centrals will be connected. The entire system, if these plans are carried out, would then include the following lines: The Fender Brothers' line from their store at Waitsburg to their establishment at Prescott; Fender Brothers' line from Waitsburg to Whetstone Hollow farms, Corbett line from Dayton to Waitsburg, through Huntsville; the Alex. Price line from Dayton to Bunday precinct; the Frank McCown line from Waitsburg up Coppei, the Thronson line from Dayton to Covello, the Cahill line from Dayton to the Cahill ranch in the mountains, and the Price line from Dayton to Bunday and to Hobinette Mountain. When this is carried out it will be possible for a man at Prescott to talk to Covello, a distance of over 25 miles.

DULUTH, WIS.—There has been considerable delay in getting the Zenith Telephone Company's new switchboard in Duluth completed. When

finished the People's Company of Superior will have long-distance wires to Minneapolis.

Miscellaneous

JASPER, COLO.—The Jasper Telephone Company has its line completed from Jasper to the Forks of Pinos Creek.

BASCOM, FLA.—Bascom is now connected with Greenwood and Marianna by telephone. Harris Dickson, the proprietor of the line, is considering a proposition to extend the line to Neals Landing, on the Chattahoochee.

CENTERVILLE, IND.—The Centerville Telephone Company has its exchange in operation. There are about ninety telephones now connected and a number of others will be put on soon.

WETUMKA, I. T.—Wetumka is to have a telephone exchange.

MAQUOKETA, IA.—F. V. Potter, of Preston, was here recently to close arrangements with the Maquoketa Telephone Company for the connection of the several farmers' lines and local exchange now being erected in and about Preston. The Maquoketa Company's toll line will in all probability run into the new exchange and the line will also be extended to Miles. At Miles connection will be made with Cinnell's Carroll County system via Sabula and through the river by cable to Savanna.

KUTTAWA, KY.—The East Tennessee Telephone Company has opened an exchange at Kuttawa. The Dawson office will be opened soon.

CASS CITY, MICH.—A petition has been circulated advocating the establishment of a municipal telephone plant here in connection with a fire alarm system. It was signed by more than sixty citizens, who promise to pay over \$1,400 to the village in order to provide funds to install the plant, the money being refunded to them in telephone rentals. The village Council is now considering the proposition.

OAKLAND, MICH.—The directors of the Oakland Telephone Company say that they will soon have the necessary work completed which will give them connection with the biggest portion of the State through the Alma Telephone Company. The connection with the Oakland Company will be made at Holly. The lines are now nearly completed.

CARROLLTON, MO.—The Missouri Valley Telephone Company has closed a contract with the Carroll County Telephone Company for connection between them. The subscribers get free exchange between all points, but toll must be paid by all who are not subscribers. This gives a service in Eastern Carroll, Chariton and Randolph counties. The Missouri Valley expects to make all county connections as soon as satisfactory arrangements can be made with the other companies, and where this cannot be done they expect to build new lines.

FREEHOLD, N. J.—The Freehold Telephone Company has extended its line to Milhurst, and has arranged to provide its country subscribers with produce reports fresh from the New York markets each morning.

TRENTON, N. J.—Manager Demarest, of the Inter-State Telephone Company, says the company will have 150 telephones in operation in a few days. The system will hardly be in good working order until Oct. 1, when Mr. Demarest expects to have 500 or 600 telephones connected. The exchange is practically completed, and the office will be transferred about Sept. 1. The switchboard will have a capacity of 4,800 lines, which will accommodate 6,000 telephones. At present the number of lines to be placed in service will be 2,640. Within three years the Inter-State Company expects to have 5,000 telephones in operation in this city.

BUSKIRK, N. Y.—The people of Easton held a meeting recently to take measures to build a telephone connection with the Buskirk and South Cambridge line and connecting with the long-distance line at Buskirk.

CANANDAIGUA, N. Y.—The Canandaigua Telephone Company is giving service in a limited way. The company has a large number of subscribers and furnishes connection with the Home exchange of Rochester, with the People's line through Western and Southern Ontario County, and will have connections with all the towns of Eastern Ontario and Wayne counties.

KINSTON, N. C.—In a few weeks it is expected that the Carolina Telephone Company will have 200 subscribers in Kinston. The linemen have had more work than they could do in putting up new wires during the past few weeks.

BELLEFONTAINE, O.—The directors of the United Telephone Company held a meeting here Tuesday afternoon at which the matter of purchasing a \$12,000 switchboard for the Bellefontaine exchange was discussed. This would make room for the accommodation of 3,000 patrons.

HAMILTON, O.—The Miami Telephone Company has installed a new switchboard at a cost of over \$5,000 and over four miles of cable and several underground conduits, making the total cost about \$15,000, in changing to the new metallic system.

RISING SUN, O.—The Oil Belt Telephone Company has changed its headquarters from Fostoria to Rising Sun.

MONTROSE, PA.—By a temporary arrangement which it is hoped will soon be permanent, the North Eastern Telephone Company has connection with Montrose over the wires of the Montrose Telephone Company. This

THE WEEKS MESSAGES Concluded

affords greatly increased and cheap facilities for reaching Forest City, New Milford, Susquehanna, and Hallstead, and many other places in the Eastern part of the county by wire.

'PLEASANTVILLE, PA.—The Union Telephone Company now has communication established with Enterprise, from the Pleasantville exchange.

CLARKSVILLE, TENN.—R. B. Crane, who with other capitalists was granted a telephone franchise here, has gone to his home in Toledo, O., to complete arrangements for the construction of the plant in Clarksville. He says that work will begin at an early date, possibly in two weeks, and the plant will be pushed to completion. Mr. Crane says the estimated cost of the system will be about \$60,000. The wires will be laid underground through the fire district. The company will be incorporated under the laws of the State and will be called the Home Telephone Company.

HALLETTSVILLE, TEX.—A telephone line has been built from this place to Williamsburg, four miles below here, by John Williams. The line has also been extended to some of the farm houses in the neighborhood.

FAIRMOUNT, W. VA.—For the second time within a few weeks the Consolidated Telephone Company has been burned out, owing to crossed wires. Nearly all the telephones were put out of use, and the loss is estimated at over \$1,500. The company had recently installed a new switchboard, and it will require some time to get it into good working order.

JANESVILLE, WIS.—Directors of the Badger State Long-Distance Telephone Company, who have been working since last fall to effect a reorganization of the company, will hold a meeting at once, and unless the stockholders take additional stock and put the company on a sound basis the mortgage on the system will be foreclosed. Some of the directors and stockholders who have confidence in the company purpose to protect the property and either buy it up or see that it is sold at somewhere near its value.

Personal

HENRYVILLE, KY.—M. C. Guernsey has been appointed manager of the Home Telephone Company's office here.

PADUCAH, KY.—Harry C. Krum has accepted the position as manager of the People's Independent Telephone Company here. Mr. Krum was formerly employed by the Central Pennsylvania Telephone Company of Wilkesbarre, Pa., and later had a responsible position with the electrical firm of Hessel & Lewis. The new telephone project in Paducah is being rapidly constructed, and the prospects of the company are exceptionally bright. The company is to be congratulated in securing such a capable man as Mr. Krum.

BRIDGETON, N. J.—Valdemar E. Edwards has been appointed manager of the Inter-State Telephone Company for this city. The Inter-State Company is making great improvements all over its lines in the upper part of the State, as well as the lower part.

EATON, O.—Arthur C. Gray, of Gallopolis, O., has been engaged as superintendent of the Eaton telephone exchange, vice Wm. Burbridge, who has resigned. Mr. Gray comes well recommended as a practical electrician.

UHRICHSVILLE, O.—J. T. Belanger, who has conducted the affairs of the Tuscarawas Telephone Company in this county for some time, has arranged to leave and take charge of a company in Texas. O. C. Onetz, of Columbus, will take the place of Mr. Belanger.

YOUNGSTOWN, O.—Frank H. Stow, general manager of the Columbia Telephone Company, at Portland, Ore., is here, having come east for the purpose of making contracts for the installing of a new system of telephones for his company. The company has at present 1,400 telephones in the city of Portland. The company expects when the new system is installed that the number will be greatly increased. A number of Youngstown men are interested in the Portland as well as the Seattle exchange.

READING, PA.—George C. Williams has been appointed local superintendent of the Reading division of the Consolidated Telephone Company. The appointment comes through S. E. Wayland, general manager of the company. Mr. Williams has tendered his resignation to the Philadelphia, Reading and Pottsville and Western Union Telegraph Companies, after a service of five years as manager of the city office. He has been identified with the telegraph department of the company for fifteen years. He is an expert telegrapher and electrician, and few men are better qualified to fill the position to which he has been called than he.

TRADE NOTES

"THE TELEPHONE GREEN BOOK" is being compiled by H. H. Robinson, who is the assistant general manager of the United States Telephone Company, Cleveland, O., and will be published in the near future by the Telephone Green Book Publishing Company, of Cleveland. The Green Book will be a complete directory of Independent Telephone Companies in Ohio, Indiana, and Michigan, giving date of organization, capital stock, officers, and every other item of information obtainable.

Much valuable statistical information will also be in the book,

together with three special papers by J. B. Hoge, of Cleveland; S. P. Sheerin, of Indianapolis, and J. B. Ware, of Detroit, setting forth the conditions in Independent telephony in their respective states. Over 1,200 subscriptions have already been received. A new Green Book will be issued each year, keeping up-to-date as far as possible with all new companies and conditions in the three states above enumerated.

THE HIPWELL MANUFACTURING COMPANY, Allegheny, Pa., has recently opened a sales office in Chicago. The new office is at 69 West Jackson Boulevard. Mr. J. A. Russell is in charge, and, with the aid of an efficient corps of assistants, is prepared to promptly and effectively attend to all business. This office is fully equipped to attend to all matters connected with the sales department, and it will considerably expedite the shipment of goods to purchasers in the Chicago district.

THE COMMERCIAL CONSTRUCTION COMPANY, Toledo, Ohio, is building the plant for the new Independent telephone company, which was recently granted a franchise in Clarksville, Tenn. The company is installing a complete central energy plant, with a capacity for 1,000 subscribers.

MESSRS. KEMPSTER B. MILLER and W. W. DEAN, of the engineering staff of the Kellogg Switchboard and Supply Company, Chicago, have gone to Colorado on a hunting expedition.

THE JOHN A. ROEBLING SONS COMPANY has completed the laying of the cable across Chesapeake Bay for the Diamond State Telephone Company.

PLANTS FOR SALE

FOR SALE.—Whole or part interest in Telephone Exchange. Present yield, 20 per cent; additional installations, 25 per cent. Entire plant, \$4,200. Excellent territory. Address W. HOWARD MEARS, Kasson, Minn.

TELEPHONE PLANT FOR SALE—160 telephones, 100 miles of toll lines; excellent opportunity for extending business; will sell for \$12,000; pays 15 per cent. net on this amount. Address TELEPHONE CO., care of AMERICAN TELEPHONE JOURNAL.

WANTED

POSITION as Superintendent or Manager in Telephone System, either on line or in exchange, by a young man of strictly temperate habits. Best of references as to character and ability. Address BOX 21, Oneida, Ill.

POSITION in exchange of from 150 to 500 subscribers as wire chief or inside workman. Have had five years' experience in the telephone business and have thorough understanding of every branch; taking care of five exchanges at the present time. Address, WIRE CHIEF, care AMERICAN TELEPHONE JOURNAL.

POSITION in exchange of from 150 to 500 subscribers, as manager or assistant manager. Experience in construction and switchboard work; best of references. Address JAMES C. THURSTON, North Vernon, Ind.

WANTED.—Position as manager of exchange of 100 or 200 subscribers; or as inspector or traveling salesman for supply house. Eight years' experience; best of references furnished. Address G., Box 125, Monroe, Ga.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISSELL CO., Toledo, Ohio.

WANTED.—A good transfer boy to take care of 125 city and 130 country telephones. State lowest wages and experience. Address VIRGIL A. GEIGER, Churubusco, Ind.

SUPERINTENDENT of construction company, position as superintendent or manager of exchange of 1,500 subscribers or more; gilt edge references furnished. Address SUPERINTENDENT, AMERICAN TELEPHONE JOURNAL.

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OPERATING TOLL STATIONS UPON THE "EXCHANGE CENTER" PLAN

By W. H. HYDE

IT has been found a good plan to establish "exchange centers" on toll lines having intermediate toll stations, so as to get an accurate check of the messages sent and received and quicker returns from the intermediate stations. The exchange center is established at some exchange near the center of the line, where

it to keep an accurate check of all the messages sent and received. The calling of the toll stations is done with an alternating generator by the exchange center.

The lines may either be ended or looped at the exchange center. If only one line for both local and through business is used,

it is best to loop the line through the exchange center, so as to permit other exchanges to ring through if necessary. (See diagram B.) This plan is applicable to both metallic and grounded lines. If used on grounded lines, bells and drops should be bridged to ground. It also may be used on toll lines radiating from exchanges. The line should run in on bridging extension bells at other exchanges on the line, instead of on drops, so that the intermediate toll stations can call only the exchange center.

The making out of tickets, keeping of check ledgers, etc., is done entirely by the exchange center office, the intermediate toll station being handled just as an ordinary local subscriber is handled, only instead of a subscriber's toll business to look after there is the miscellaneous business of an intermediate toll station.

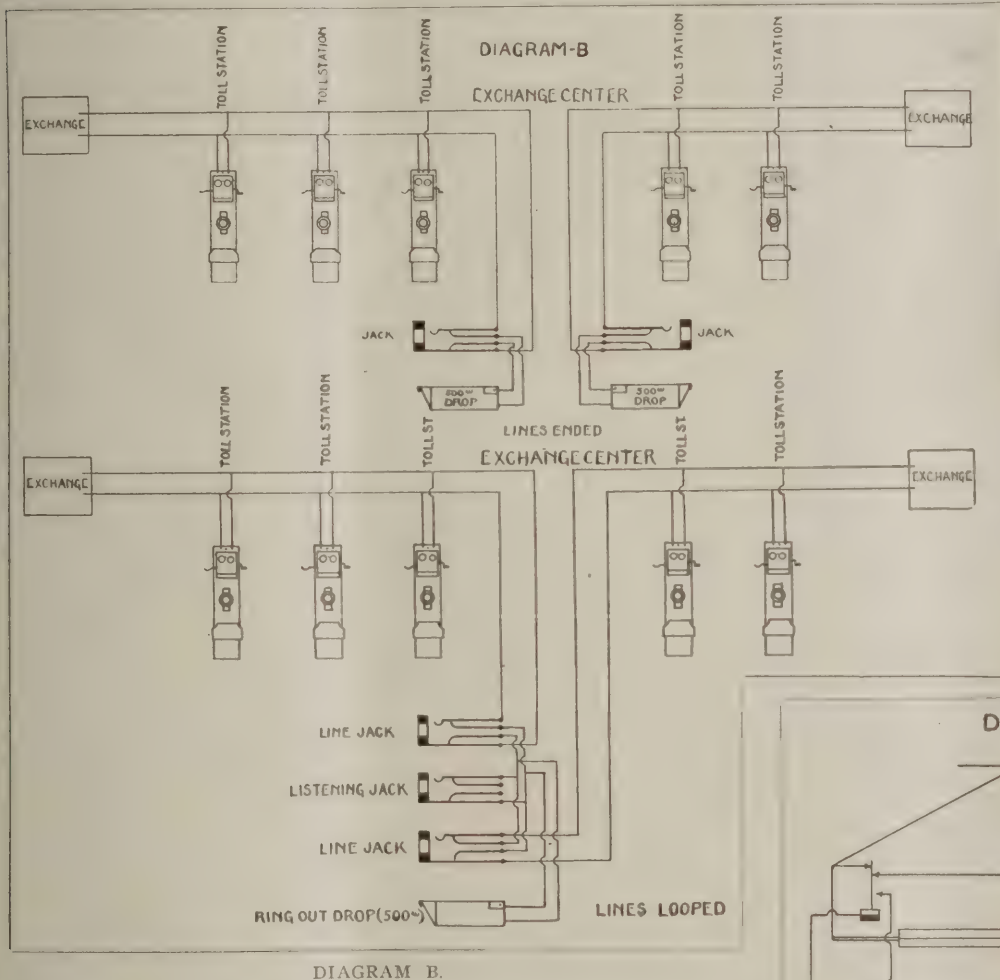


DIAGRAM B.

paid operators are employed both day and night. The intermediate toll stations are equipped with "one-way" bridging bells—that is, bells whose generators only generate a pulsating current which will not actuate its own or other polarized ringers on the line, but will throw a drop at the exchange center. This is done by placing a split bushing on the commutator of the generator of the bell, one half of which is connected with the armature coil; this connects the coil to line during one half of each revolution, causing a pulsating, or interrupted, direct current. It is necessary with these bells to remove the receiver from the hook before ringing. (See diagram A.) These bells are now made by several manufacturers.

By using these bells, intermediate toll stations are enabled to signal the exchange center without ringing the bells of the other stations, thus avoiding excessive ringing of bells; the toll stations also are prevented from calling each other direct, thus giving the exchange center absolute control of the line and enabling

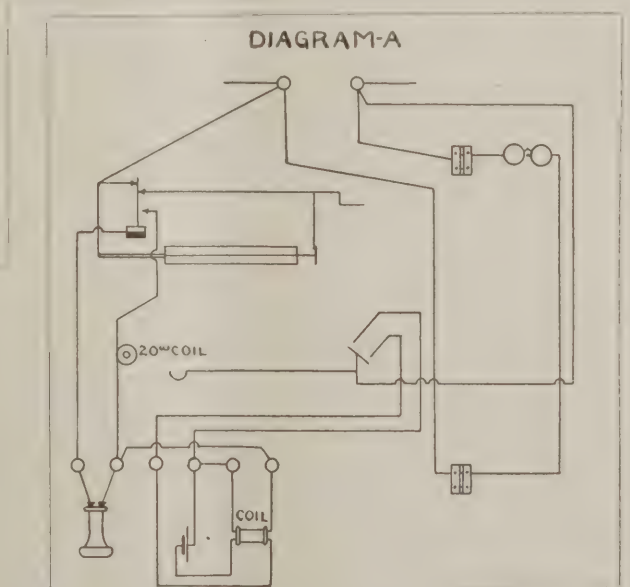


DIAGRAM A.—TOLL LINE OR PARTY LINE. REMOVE TELEPHONE FROM HOOK BEFORE USING.

A monthly toll bill is made up at the end of each month against each toll station by the exchange center, and mailed to the agent.

with instructions to check over the bill and remit for same to the general office. It is well to provide toll agents with a supply of toll tickets, so that they may keep track of messages sent by them and so may check bills when received. The exchange center makes out the monthly toll reports and sends them in with the tickets to the general office, where the collection of accounts is looked after.

When the business of small toll stations is handled in this manner it is found to be a great improvement over the old way, as it does away with the necessity of being obliged to await the pleasure of numerous small toll agents. The general office is enabled to get in monthly reports promptly and to check up the business without delay, and the results have been found more satisfactory all around.

THE CURRENTS OF A MAGNETO GENERATOR

Answer to a Correspondent

A CORRESPONDENT makes the following enquiry: Can a telephone generator be made to give a direct current, and how? Does an alternating current leave one wire and have a general direction and alter in that way? Or does it shoot out first on one wire and then on the other? How can the general direction be told, if it is general? S.

The magneto-generator used in telephone work is a small alternating current dynamo. As our correspondent seemingly has rather indefinite ideas as to the mechanical generation of electric currents, it may be well, and possibly may interest others if we go back to first principles. The foundation of practically every branch of modern electrical engineering is the mysterious relation between magnetism and electricity. Put a magnetic needle, balanced so that it will swing freely on a pivot, near a wire in which a current of electricity is flowing and that needle is immediately influenced by the current in the wire, changing its position according to the strength and direction of the current flowing in the wire. On this reaction between electricity and magnetism depends many electrical measuring instruments, beginning with the *galvanometer*, the father of all electrical measuring instruments, and the earliest forms of telegraph instruments utilized the same principle. Wind an insulated wire round a bar of soft iron and connect the two ends of the wire to an electric battery and you convert the inert bar of iron into a powerful magnet, the strength of the magnet depending on the size of the iron bar, the number of turns of wire in the winding and the strength of the current circulating in the wire. Disconnect the wire from the battery so as to interrupt the current and the bar of iron immediately becomes de-magnetized and returns to its former state of inertness. On this wonderful effect Morse founded his immortal invention of the electro-magnetic telegraph, and on the action of the electro-magnet, which can be magnetized and de-magnetized instantaneously by simply turning on and off the current, depend all telegraph sounders and relays, telephone indicators and many other pieces of electrical machinery.

More wonderful still than either of these beautiful effects of the relation between electricity and magnetism is that which results in the production of a current of electricity in a wire which is moved in the vicinity of a magnet. Between the two poles of a horseshoe magnet there exists what is termed a field of magnetic force; we conceive the space directly between the poles of the magnet to be traversed by a number of lines of magnetic force which pass from one pole of the magnet to the other. If now we take a loop of wire and so dispose it that it can be revolved within the field of a magnet, between the poles of the magnet, a current of electricity will be generated in that loop of wire. On this wonderful effect rest all modern dynamos and motors, from the 5,000 horse-power generators at Niagara down to the hand generator in the telephone subscriber's instrument, which, as we have said, is simply a small alternating current generator.

We now reach the crux of our correspondent's enquiry. A coil of wire revolved in the field of a magnet will have generated

in it an alternating current, which will change its direction twice in every revolution of the coil, because the coil changes its position relative to the lines of force which it cuts twice in each full turn. The direction of the current generated in the coil depends upon the direction in which it cuts the lines of force; since in each full turn the coil is half the time cutting across the lines of force in a downward direction and half the time is cutting them in an upward direction it follows that the direction of the current in the coil will be reversed twice during each full revolution; in other words, that an *alternating* current will be generated. If the two ends of the coil be connected to the wires of a line circuit an alternating current will be sent out along that line—that is, a current that rapidly reverses its direction through the entire circuit, circulating first in one direction and then in the other, the rapidity of the alternations depending on the rapidity with which the coil is revolved; if an electro-magnet is connected to the distant end of the circuit the magnetism of that electro-magnet will be reversed with every alternation of the current, and consequently if the electro-magnet is provided with an armature adapted to rock or vibrate, that armature will be vibrated as an effect of the changes in the magnetism of the electro-magnet. That is what goes on in the circuit of the telephone generator and ringer.

The first dynamos were alternating dynamos because that is the simplest form of machine by which electric currents can be generated mechanically. The ends of the coil or coils constituting the *armature* as the revolving part of the machine is called, are connected to simple ring collectors by means of which brushes bearing on the surface of the rings convey the current to the line circuit. But an alternating current is not suitable for all purposes and soon a demand arose for direct current dynamos. A direct current dynamo is really an alternating current dynamo provided with a device called a *commutator* by means of which the line wires are connected to the armature coils in an opposite manner at each half revolution of the coil. The current generated in the coil alternates at each half revolution, but by means of the commutator, the coil is connected to the line in an opposite manner at each half revolution so that the currents delivered to the line are all in the same direction and what is termed a direct current is the result.

The commutator of a direct current dynamo is a delicate and complicated device, and the construction of a direct current armature is more complicated and expensive than that of an alternating armature of similar capacity. Direct current hand generators are not used at all in telephony, both for those reasons and because an alternating generator serves all purposes. For ringing, a vibrating bell gives the best signal, and if a direct current were used the bell would have to be a special trembling bell, whereas, the telephone polarized ringer is a much simpler, more sensitive and more satisfactory device. Direct current generators are used for some purposes in telephone exchanges generally driven by a motor mounted on the same shaft, and for certain purposes a direct pulsating current instead of an alternating current is used for signaling.

"WIRELESS" NOTES

DR. MICHAEL I. PUPIN, of Columbia University, the inventor, returned to New York from Europe a few days in Germany and Austria, in connection with his telephone invention for increasing the range of long distance lines. He said that it was being made of practical use there. In talking of the suits instituted by the Marconi Company against other wireless telegraph companies, alleging that they were infringing the Marconi patents he thought the Marconi company would win. He based his opinion on the fact, he said, that all the wireless telegraph companies apparently are obliged to use Marconi's invention of two upright wires to receive and forward the messages.

Prof. R. A. Fessenden, says the *Pittsburg Leader*, has left Pittsburg for the East after holding a consultation with his lawyers over patents. Several weeks ago two expert operators were able to send messages by the Fessenden system at the rate of 65 words a minute, but this was only maintained for several minutes. The experiment was to satisfy the government experts that the system was a commercial success. It is asserted by Prof. Fessenden that a telephone conversation may be carried on without wires for a distance of 250 miles and that 1,000 miles is about the limit in sight at present for wireless land telegraph messages. Cities will be no interference, the wave length being increased to a certain point in excess of the height of the buildings intervening.

LONG DISTANCE TELEPHONY—II.

By P. KERR HIGGINS

MANY and varied are the duties which fall to the lot of the telephone man, but few are so pleasant and interesting as that of surveying a new toll line. It is at once a combination of business and pleasure and in the pursuit of the business it is often possible to benefit by the pleasant and healthful surroundings. One rule stands out prominently, namely, "Adhere to a straight line wherever possible." All lines need not have the same number of poles to the mile, and this question must be determined before work is begun. The distance between poles,

color; the location of guy stubs is marked in the same manner. When it is necessary to turn a corner at right angles, two poles should be used (Fig. 4). If the turn is very abrupt it is good practice to reduce the length of the spans on each side. If, for any reason, it is necessary to make a long span, say 400 feet or over, the span on each side of it should not exceed 75 feet. The line having been properly measured off and staked out and the poles distributed, the digging squad is sent out.

In digging the holes it is well to leave two inches clear around the pole for tamping. The depth should be as follows:

Height.	Soft ground.	Clay.
25 feet	5 feet	4.5 feet
30	5.5	5
35	6.	5.5
40	6.5	5.5
45	7.	6.
50	7.	6.

The digging set will usually consist of: 1 long-handled spoon (8 feet), 1 long-handled round pointed shovel, 1 8-foot combined

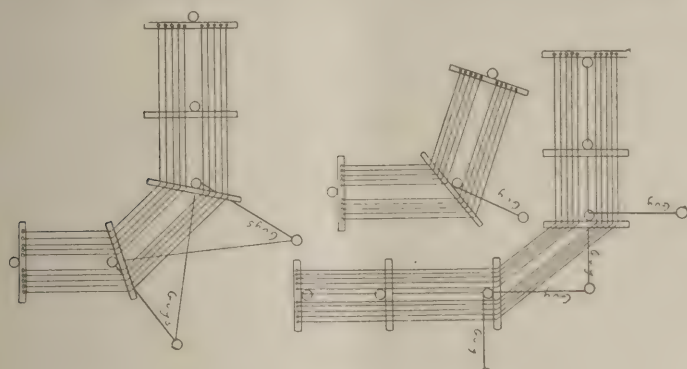


FIG. 4.—METHODS OF GUYING CORNERS.

in feet, is obtained by dividing 5,280 by the number decided upon; this distance applies only on straight stretches.

The standard line is usually understood to be 40 poles to the mile, but 32 poles is a very popular number, and on the average toll line is sufficient. When only one circuit is necessary, 20 poles would be enough, as this number could easily be doubled in the future, if found necessary, by setting a pole in each span when

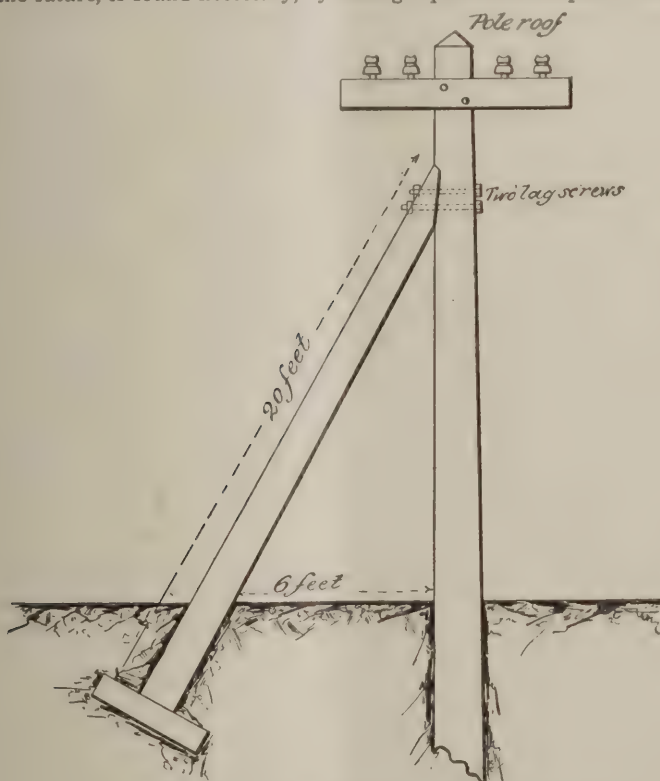


FIG. 5.—METHOD OF BRACING FOR CORNER POLES.

the necessity arose. The number of poles should be increased at bends and sharp curves, so as to counteract the strain. In leveling the line, all abrupt changes in grade must be allowed for. The location chosen for the poles is generally indicated by a wooden stake (20 inches long by 1 3/4 inches) driven into the ground, and the size of the poles is indicated by the color of the stake, plain white being 25 feet, and every 5 feet thereafter a different

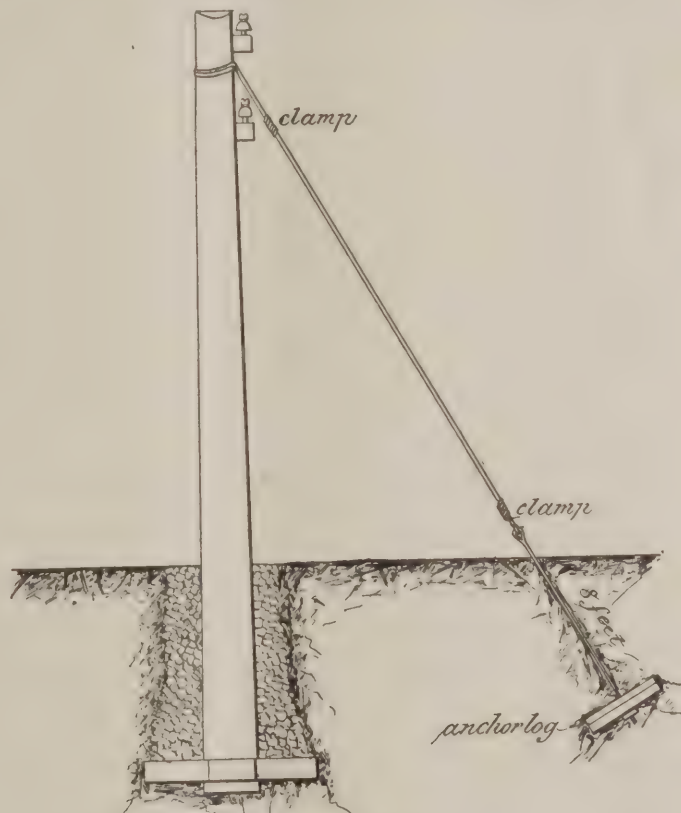


Fig. 8. Method of using guy.

crow and digging bar. In average soil one man should be able to dig eight 6-foot holes per day.

SETTING POLES.

It is usual to have a gang of six men digging, equipping, and setting the poles, and the following tools are necessary: 2 12' pike poles; 2 14' pike poles; 2 16' pike poles; 2 dead men (one 6' and one 8'); 1 cant hook; 2 tamping bars; 1 short-handled shovel; 2 carry hooks; 1 piece of hard timber 9x8x1 1/2; 1 set double sheave block and tackle; 300 feet 1/2" rope. The gang should be distributed as follows: 1 man on "dead man"; 4 men on pike poles; 1 man at butt of pole near hole.

In distributing the poles the heaviest should always be placed at the corners, and the straightest and best looking reserved for towns or in front of residences. In setting, the alternate poles should be so arranged that the cross-arms face in opposite directions. Once the pole is set and while the alignment is being made, the pole should be held in place by means of the pike poles. If it is necessary to use cement for the foundations at any time,

the following will be found useful: 1 part hydraulic cement; 2 parts sand; 5 parts screened gravel.

In setting poles in shifting sand, as in a river bed, or on the sea shore, it is well to set the pole inside a barrel and fill the barrel with rocks and sand.

In painting poles, the following serves well: 7 lbs. Prince's metallic paint; 1 gallon linseed oil. This should be mixed and in order to make it wear, sand may be blown into it after it has been applied. The gains, roofs and other cut parts of poles should receive two coats of best white lead. At corners it is well to give all poles a lean of about 20" against the strain. On curves and sharp corners it is well to set poles, over 30 feet high, about 8" deeper than on the straight line. The tops of all poles should be roofed at an angle of 45° (Fig. 5.); gains should be cut 24" apart, depth 1/2" and width 4 1/4". They must be square and true with the axis of the pole and the other gains on same pole, the first gain being only 8" from ridge of pole.

QUALITY OF POLES.

All poles should be of selected, straight, live, second growth, with butt and top squared; free from splinters, bark, stumpage,

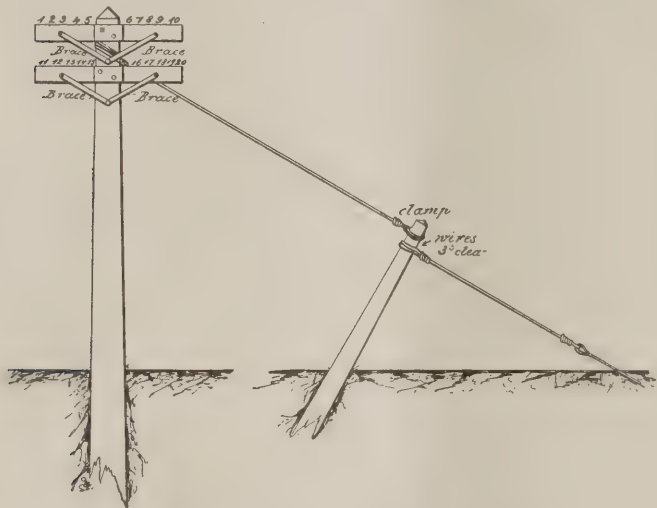


Fig. 6. Method of Using Guy Stub.

dry or wet rot, and with all knots closely trimmed. They should measure 6 feet from butt as follows:

- 25-foot pole, 33 inches in circumference.
- 30-foot pole, 34 inches in circumference.
- 35-foot pole, 36 inches in circumference.
- 40-foot pole, 38 inches in circumference.
- 50-foot pole, 42 inches in circumference.

The life of different classes of poles is as follows: Norway pine, about 6 years; chestnut, 15 years; cypress, 12 years; white

cedar, 10 years. The latter is the most popular because of its good appearance and light weight.

GUY STUBS.

These should be of the same quality as the poles and not less than 24" in circumference at the top. The anchor logs (Fig. 8) should be 31" x 5' long and well seasoned. There is sometimes a considerable waste made by irresponsible foremen in cutting up good large poles for guy stubs; this can usually be avoided by providing the stubs beforehand and locating them at the same time as the poles.

CROSS-ARMS.

All cross-arms should be sawed from close-grain heart wood of selected yellow leaf pine. They should be free from imperfections, kiln-dried and thoroughly seasoned, measuring 4 1/2" x 3 1/4" and be 10' long, for a capacity of 10 wires. The top of a cross-arm is generally chamfered to a radius of 40°, 10" in the center being left uncut so as to fit tight in the gain. The standard cross-arm is generally 10-pin, each pin being 1 1/2" in diameter (Fig. 6). A space of 16 inches is allowed between the two inside pins and 12" between centers of all other. Cross-arms should be bored for one carriage bolt, two lag screws and two brace

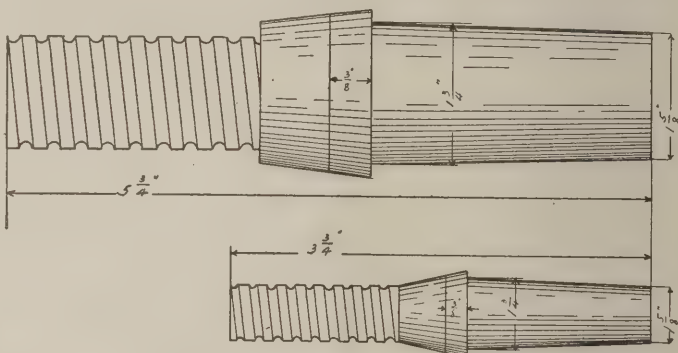


FIG. 7.—TOP VIEW, TRANSPOSITION PIN. BOTTOM VIEW, STANDARD TOLL LINE PIN.

bolts. The locust pins are held in place by nails driven through the cross-arm and the base of the pin. It is customary to give the arm two coats of black paint having a slight mixture of asphaltum; the paint commonly used is a mixture of carbon gas black, pure boiled linseed oil and B and T dryer.

PINS.

These should be of best quality split locust, free from knots and soft wood, and sound throughout. They are usually 8' long, 1 5/8" at shoulder, thread 1" at top and gradually increasing to 1 1/4". Special pins are often used at transpositions, if special insulators other than the double grooved (Fig. 7) are used.

AN ALLEGED FRENCH INVENTION

DAILY papers of this country recently printed a special cablegram giving the information that Captain Charollois, of the French Army, had just invented a new telephone system for use in war. It was stated that this was a strictly new and original method of telephonic communication and that it enabled moving bodies of troops six or seven miles apart to keep as closely in touch as though they were on the parade ground. This was said to be something hitherto unachievable. The system was described as being simply a strong wire trailed on the ground with telephone sets connected at either end. It was further alleged that trampling on the wire did not disturb the circuit or interfere in any way with telephonic communication.

As a matter of fact, this alleged wonderful and original invention of the French captain is not new at all. This system has been used by the American Signal Corps for over ten years, and there is nothing in the invention of Captain Charollois that has not been used by the Signal Corps.

Lieutenant-Colonel Samuel Reber, of the Signal Corps, with whom an interesting interview was recently printed in the AMERICAN TELEPHONE JOURNAL, on "Telephones in War," read some clippings taken from the American daily papers giving glowing accounts of this new invention of the French army officer. He said it was evident either that the French officer had never heard of what the American Signal Corps had accomplished with war telephones, or that the reporters responsible for the accounts in the papers never had.

"The American Signal Corps," said he, "used that system as early as 1891, and have continued it successfully ever since."

Col. Reber is one of the greatest authorities on telephonic communication in war, having made the study of it his specialty. He has written a book furnishing detailed instruction on the construction and operation of telephones in field service under actual war conditions.

BELL COMPANY FORCED OUT OF ELKHART, IND.

THE Bell Telephone Company is reported to be preparing to abandon Elkhart, Ind., except for the long distance business. Since the Home Telephone Company commenced business in Elkhart, the subscription list of the Bell has dwindled from 450 to below 200. In anticipation of the early withdrawal from the field by the Bell Company, the Home Company is making extensive arrangements to enlarge its facilities. In the last week, \$2,400 worth of cable has been received, and Manager George Fister will at once start the work of erecting new poles and stringing wires for 600 new telephones which have been contracted for.

He has entered into a contract with the South Bend Home Telephone Company, which is about to throw down the gauntlet to the Bell Company at South Bend, for a toll line between the two cities. This, he says, will be the last straw to break the Bell camel's back in Elkhart.

FOREIGN CURRENTS

ACCORDING to the interesting "Telephone Notes" published in our London contemporary, the *Electrical Times*, opposition telephony in England makes steady if somewhat slow progress. The opposition to the monopoly of the National Telephone Company proceeds entirely from the municipalities of the different large cities, and is animated partly by the general desire of English municipalities to control the public services, such as water and lighting supply, street railways, and now the telephone; partly by the widespread demand for cheaper telephone service, and just a little by the unpopularity of the National Telephone Company, which seems to have few friends, either among the press or among the general public. The usual procedure of the municipalities in dealing with the telephone service is to put in a very cheap system, without much regard for possibility of future development, charge a very low rate, and be satisfied with a minimum rate of interest on the money invested and a sinking fund calculated to repay the original capital in 25 years.

* * *

Actual facts are always interesting, and, since figures have lately been published relating to the results achieved in the working of some of these municipal systems and relating to estimates for the establishment of new ones, it may be of interest to quote some of these figures. No very exact comparison can be made with similar results obtained in this country, for the reason that not only are labor and materials very much cheaper in England than here, but no particulars are published as to the kind of telephone system employed. All of the municipal systems in England have been built by the same engineer, Mr. A. R. Bennett, who has made quite a specialty of this kind of work. It is fairly safe to assume that as regards the kind of telephone plant put in by the English municipalities the cable and pole-line work is good and the switchboard and subscribers' station apparatus old-fashioned. The central energy system is scarcely used in England at all except in the new Post Office London exchange and in a few of the larger exchanges of the National Telephone Company.

* * *

In his report on the proposed municipal system for the ancient town of Rochester, the service to include the neighboring towns of Chatham and Gillingham, Mr. Bennett estimates that a complete equipment for 600 subscribers could be provided for \$51,500, an average cost of \$85.50 per station. For a further expenditure of \$15,000 duct and pole-line accommodation could be provided for 600 more lines. Mr. Bennett recommends a flat rate of \$27 a year, with the alternative of a toll or divided message rate of \$17.50 a year maintenance charge plus a charge of two cents for each message. The obviously weak point about this tariff is that the flat rate is too near the message rate, or *vice versa*, whichever way you choose to look at it. At two cents a message, 450 messages in a year would bring the message rate above the flat rate for unlimited service. Consequently, nobody who wanted anything but a mere receiving station would take the message rate. With a use of but one call a day the message rate customer would be paying within \$3.50 a year as much as the flat rate customer who has unlimited service. It is interesting to note that Mr. Bennett does not recommend party-line service, believing that the delays and lack of secrecy attending the use of this class of service bring discredit on the whole system. In this opinion Mr. Bennett will find not a few sympathizers among American telephone men.

* * *

From Mr. Bennett's estimate of working expenses it appears that a telephone exchange can be run pretty cheaply in England. It is highly necessary that a municipal exchange should be run cheaply, as the only reason for its existence is the offer of a cheap service to the public. The municipal system is tied to a low flat rate, it has no toll-line traffic to help out its exchange revenue, and about thirty per cent of its gross revenue has to go for Post Office royalty, interest and sinking fund. Consequently, if it is not run very cheaply indeed there will be much difficulty in making both ends meet. The estimate for Rochester, which is fortified by the results actually achieved in two other systems under Mr. Bennett's supervision, allows approximately \$2.90 a line a year for management and technical staff, \$3.60 a line a year for operating staff, \$1.10 for rent, light, heat, etc., of switch rooms and offices, \$1.65 for stationery, printing, postage and

office expenses, 60 cents for rights of way, \$1.35 for line and instrument inspection and repairs, making, with an allowance of \$1.25 for contingencies, a total yearly operating expense of \$12.45 per line. There is no provision for depreciation unless the sinking fund, calculated to pay off the capital in 25 years, can be regarded as such. Some telephone men will hardly be inclined to credit that a telephone plant, even a municipal telephone plant, put in in 1902, will, for a yearly expenditure of \$1.35 per line, be maintained in good condition until 1927. According to his estimate, Mr. Bennett shows that the estimated yearly revenue of about \$16,000 will yield a surplus of about \$2,250 over and above all expenses.

* * *

The largest municipal telephone system in England and the first in actual operation is that at Glasgow. A report has just been issued of the results of the first nine months' working which contains some interesting figures. Those responsible for the scheme have found that the business is likely to grow to proportions far beyond their original anticipations, a discovery that has been independently made by many telephone men operating in other parts of the world. The original plans for the Glasgow system provided for 5,250 completed lines, with duct accommodation and central office space for a future growth to 10,500. Instead of adhering to these modest figures (Glasgow has a population of over 700,000), the system actually constructed has an underground duct capacity for 27,000 lines, there being at present laid in the ducts, cables containing 14,572 pairs of wires, of which, however, only a little more than a third are yet in use. The work done on the underground system in laying ducts, building manholes and drawing in cables has been three or four times as much as that originally contemplated. In view of the tendency of many builders of telephone systems to under-estimate the probable future growth of a telephone system in an active center, the experience of Glasgow is a highly instructive one. And it would seem that, given the population, wealth and commerce of Glasgow, the new telephone system, with its low rate, is still far from being laid out on sufficiently liberal lines to cope with the growth that will occur in the next few years.

* * *

The total capital expenditure to the date of the report has been \$960,000. Of this no less than \$80,000 was expended on the famous Glasgow telephone enquiry, on promoting and opposing bills in Parliament, and so forth, and for working expenses from the date of first operating the exchange in March, 1901, until revenue began to be earned in September, 1901. The actual cash spent on the plant is about \$880,000. This has provided 5,479 lines completed and working and 8,787 partially completed lines. It is calculated that the average capital cost of the completed lines is \$97 apiece. The estimated cost per line was \$95, and the small difference is accounted for by the adoption of underground distribution to subscribers' offices and by the substitution of underground for overhead work on the trunk line routes, neither of which was originally estimated for. The flat rate at Glasgow is \$26, and there is a toll or message rate of \$17.50 maintenance charge and two cents a call. The adoption of the message rate by the few who find they can make a small saving by it, brings the average revenue per subscriber down to about \$25.70. The working expenses for the nine months are said to work out to an average of \$19.10 per line per year, including interest, sinking fund, etc., but the report ingenuously states that "no depreciation has been allowed for, as the system is not yet completed, and what work has been done is not yet one year old." The last interesting note in the report says that the 5,494 instruments connected are paid for by 4,697 individuals and firms, and 2,059 of these have never subscribed to a telephone exchange before. About 1,700 orders are still to be filled, and every day brings new application.

The Arrestor.

TELEPHONE NAPKINS

In Vienna telephone booths are furnished with napkins bearing the inscription, "Wipe, if you please." The napkins are changed frequently, and this undoubtedly serves to keep the mouthpieces of the transmitters in good sanitary condition.

Opinion and Comment

INDEPENDENT DEVELOPMENT

A MAGAZINE article, by the editor of THE AMERICAN TELEPHONE JOURNAL, published on June 14, in the Saturday Evening Post (of Philadelphia), aroused considerable comment throughout the country because of the remarkable showing made for the rise and progress of the Independent telephone industry. From the tone of these comments it was very evident that to the general public, the facts and figures given came as a complete surprise. And not to the general public alone. There were thousands of men actively engaged in the industry who were amazed at this summary which had been very carefully compiled from the most reliable sources. Though in the front rank of the movement, these men had no conception of the marvelous strides that the industry is making. Nor is this particularly strange, for the Independent telephone companies are developing at a rate unprecedented in any other line of business, and to keep in touch with this expansion requires constant and careful survey. Where other lines of industry are content to expand by hundreds, the Independent telephone movement is expanding by thousands. It is true, literally, that statistics in force to-day are dead and worthless to-morrow. Thus, for example, when the material was gathered for the magazine article mentioned above, a careful canvass showed about 6,000 Independent companies in the field. To-day a canvass, not yet complete, shows nearly 8,000. The editor of this paper recently made a tour of the States of Ohio, Illinois, Indiana, and parts of Pennsylvania and New York. Almost everywhere he found construction work going on day and night. The manufacturers were, almost without exception, hehind their orders and bending every energy to catch up. This state of things shows conclusively that the Independent operators have back of them the approval of the people.

Their prosperity is the best possible evidence of popular support without which an industry that is so peculiarly dependent on the co-operation of the consumer cannot permanently endure. The growing subscription lists of the Independents show that the operators are giving a high-class service and that the manufacturers in the Independent field are turning out equipment that does its work perfectly. Almost invariably where the Independents are working side by side with the Bell, the former are going rapidly ahead while the Bell companies are either standing still or going backward. To this condition there are practically no exceptions.

THE TELEPHONE IN FICTION

ONE of the signs of the times, indicative of the important place the telephone is taking in the life of to-day, is the frequent use of the telephone in fiction. And not merely in the fiction of the "Looking Backward" order, where more or less everything is done by electro-mechanical means and the book itself reads as if it had been written by a machine, but in fiction of some human and dramatic interest, in which the main plot or some important incident hinges on a legitimate or illegitimate use of the telephone. The writer of fiction is apt to err sometimes on the side of poetic license in dealing with the telephone and is quite likely to be loose in his technicalities, but the very fact that he does so often turn to the telephone for novel incidents and situations shows what a strong hold the telephone is taking on the affairs of all sorts and conditions of men.

The most striking instance of recent times of the use of the telephone in fiction is the play, already famous in Europe, called "At the Telephone." This tragic little drama has made a sensation both in London and in Paris, where it was originally produced, and no doubt it will soon be well known all over this country, as it is to be put on in New York during the approaching theatrical season. The thrilling incident of the play is where an unhappy man practically wit-

nesses by telephone, the sacking of his country house and the murder of his wife and child by brutal criminals while he, being several hours' journey away, is utterly powerless to render any assistance whatever. As may well be imagined, this blood-curdling situation offers a tremendous opportunity to an actor of emotional powers. It is certainly a highly ingenious dramatic rendering of the possibilities of the telephone.

As might naturally be expected the opportunities of the telephone for aiding and abetting the perpetration of crime, rather than its peaceful and much more usual services in the development of commerce and of social relations and in smoothing domestic difficulties, are those that are generally exploited by the story-writer who uses the telephone as an accessory. In one story we read not long ago a mysterious murder was carried out by means of a subtle poison sprinkled surreptitiously on an innocent telephone transmitter. Our limited knowledge of toxicology does not permit us to say that no poison capable of such effects exists, although we strongly believe that to be the case. In this particular story, however, the horrid poison did its work most effectively, the unwilling telephone accomplice was never suspected, as the poison, after killing, conveniently evaporated, and the stealthy miscreant who put it on the telephone, successfully defied the efforts of the finest detective force in the world to discover who he was and how he did it.

In another recent short story a more daring and determined villain, who had sworn revenge on a brilliant criminal lawyer for sending a relative to the scaffold, adopted the ingenious scheme of fastening an infernal machine to the telephone in his proposed victim's office in such a manner that the first stroke of the bell would send office, victim and all to eternal smithereens. The brilliant lawyer was working alone in his office at night when the inventive desperado fell on him, bound and gagged him, and then coolly adjusted the explosive machine to the telephone bell so that the bell hammer would explode it when the first call came. Fortunately a friend came in and relieved the awkward situation by removing the infernal little appliance, just in the nick of time. A call came a moment later, which was natural and certain, for if it had come a moment sooner the story would not have been written.

Coming down to the less tragic but most annoying crime of theft, the telephone was recently used—also in a short story—in a most ingenious way to aid in the theft of a very valuable diamond necklace. This piece of work required an accomplice or two and some manoeuvring, lacking the bold simplicity of a single actor that distinguished the two previous stories. The necklace was at a jeweller's establishment and was called for by a valet. The jeweler, not knowing the valet, and the valet not presenting a written order, demurs. Whereupon the valet suggests that he call up the owner of the necklace on the telephone and get her authorization to deliver the gems to him. As he, being a thief and covetous of the necklace, had altered the telephone card hanging by the instrument so as to give the number of a public station where the number of the telephone at the house of the owner of the necklace should have appeared, and furthermore had taken the precaution to have waiting at that public station a female accomplice who imitated perfectly the voice and manner of the owner of the necklace, the authorization was promptly forthcoming and the necklace was handed over to the thief.

To the telephone man, who would of course rather see the telephone used, as it so often is in real life, for the prevention and detection of crime, the capture of criminals and their general discomfiture instead of as an innocent accomplice in evil-doing, the only sympathetic note in this frequent use of the telephone by the writer of fiction is the evidence that it gives of the general familiarity of all kinds of people with the working of the telephone and of the assumption of the authors that the telephone is to be found everywhere, and that everybody uses it and relies upon it for all kinds of purposes.

IN THE OPERATING FIELD

A WISE INVESTMENT IN ERIE, PA.

THE Mutual Telephone Company, of Erie, Pa., is a company which was organized, as its name indicates, for mutual benefit and to protect the citizens of Erie against the monopoly of the Bell Company. The company was organized about five years ago. At that time the Bell Company had about 450 subscribers in the entire city and a plant constructed of iron wire with a grounded circuit and the old Blake transmitter, a very crude and almost obsolete construction. Thinking they had an undoubted monopoly they refused to give any lower rates than \$75 and upwards for business, and \$48 for residences. The Mutual Company started in with 350 subscribers for telephones and made a contract for a plant for 600 telephones. Before the contract was complete the Mutual Company had 650 subscribers. It started with a rate of \$40 for business and \$28 for residences, with copper wire and return circuit, and gave to stockholders a rebate of \$4 a year, making rates to stockholders \$36 for business and \$24 for residences. To be brief, the company has now about 1,500 telephones and is still growing. It has built its own exchange building, put in an entire new switchboard with a capacity of 2,200 telephones and has an up-to-date plant in every particular. Its service is first-class and it answers calls on the central in an average of about six seconds. The company is capitalized at \$75,000 stock and \$75,000 bonds. It is now refunding its six per cent. bonds into five per cents. The company has promptly met all its interest charges and has paid two per cent. quarterly dividends from the start and has had a surplus of about \$5,000 a year which has gone into new construction. This showing is made in the face of the statement made in the beginning by the Bell Company that a telephone could not live at less than the rates they demanded, which were \$75 and \$48. The plant is in fine condition, giving the best of service and the company is reaching out for 2,000 subscribers and expects to have them. Its securities are eagerly sought after, the stock selling for 20 per cent. premium and the bonds meeting with a ready sale.—Wm. B. Trask, President Mutual Telephone Co., in *Finance*.

THE ILLINOIS CENTRAL RAILROAD TELEPHONE SYSTEM

THE Illinois Central Railroad now has its line between Chicago and New Orleans, a distance of 922.65 miles, in working order and also those between St. Louis and Carbondale and Grenada and Water Valley, having mileages respectively of 94.51 and 28.62. This makes a grand total of 1,045.78 miles of telephone circuits completed. The line between Chicago and New Orleans is the main line of the system, and the several branch lines now complete, or in course of construction, are feeders to that line. The St. Louis-Carbondale line connects St. Louis with the main line at Carbondale. The Grenada-Water Valley line connects Water Valley with the main line at Grenada. Another important branch is now being constructed from Fulton, Ky., on the main line, to Louisville. This will be ready for operation in a few weeks. It will be 272 miles in length. The Water Valley branch will eventually be extended to Fulton, via Jackson, Tenn. The lines out of Chicago, west to Omaha and Sioux Falls, will eventually be constructed by the railroad. It is stated now that every passenger and freight train will be equipped with telephone sets by which connection with the main offices of the company can be had at any place on the line in case of an emergency.

AN ASPIRING OPERATOR

A TELEPHONE girl Miss Mattie Beals, working for a Topeka telephone company, had ambitions beyond sitting at the switchboard. When the Government announced it would throw open a lot of land in Oklahoma Miss Beals decided that was a good way to step into a prize. Accordingly, she left the switchboard, endured without a murmur hardships which many men would hesitate to face, and as a reward drew the second prize, which was estimated to be worth over \$50,000. To cap the climax of the highly successful career of Miss Beals, it has been an-

nounced that a Chicago grocery clerk has wooed and won her. Her trousseau is said to have cost \$2,600, just about one-twentieth of the value of the land won.

INDEPENDENT TELEPHONE SECURITIES

THERE is in the minds of a certain class of investors a prejudice against Independent telephone securities which, to say the least, is unwarranted. People who refuse to put their money into this class of securities give as a reason that the opposition of the Bell combine is so great that these securities are constantly imperiled. This is not true in any greater sense than is the case with traction securities or the securities of any other public service corporation. It has been clearly demonstrated that the telephone business can be made very profitable, and there are very few cases indeed where Independent telephone plants have not only proven very remunerative but have also quickly taken the business of the rival Bell companies.

There are hundreds of towns in Ohio and Michigan where Independent telephone companies have practically secured all the business of their localities and almost put the Bell Company out of business. In the matter of the increase in price of the underwriting, almost without exception, people who purchased underwriting of Independent telephone companies and who have held it until the property was fully developed, have in almost all cases nearly doubled their money. The Independent plants in Ohio, Indiana and Michigan, and in other States of the Union are doing the business and will continue to do it for the reason that in almost every case a large block of the stock is held by the local business men who may be depended upon to see that the local company gets the business.

The only danger in the building of Independent telephone plants seems to be in the matter of bonding. Of course, an Independent telephone plant can be bonded for a great deal more than it will stand and disaster is sure to come, as it would come to any other institution that was bonded for more than it could stand. Telephone plants economically built and carefully financed are sure to prove remunerative for a long term of years and the time is not far distant when the prejudice against this class of securities will be removed.—*Finance*.

A JOKE ON THE LONG DISTANCE

THE New York Sunday *Times* prints the following colloquy between the Waldorf-Astoria photographer and a long distance operator:

Falk, the photographer, during a recent stay in Boston, had occasion to call up his New York studio on the telephone on an urgent business matter. It was apparently an off-day for the long-distance instrument, for after waiting over twenty minutes for the connection he found that New York couldn't understand him. Central kept on enjoining him to "speak louder" until Falk's stentorian tones threatened to shatter the delicate diaphragm and he felt himself growing purple in the face. Still New York couldn't get him. Once more Central called out querulously:

"Say, Boston, you'll have to talk up louder if you want New York to hear you."

"Talk louder!" rejoined the photographer. "If I could talk any louder I wouldn't need your telephone."

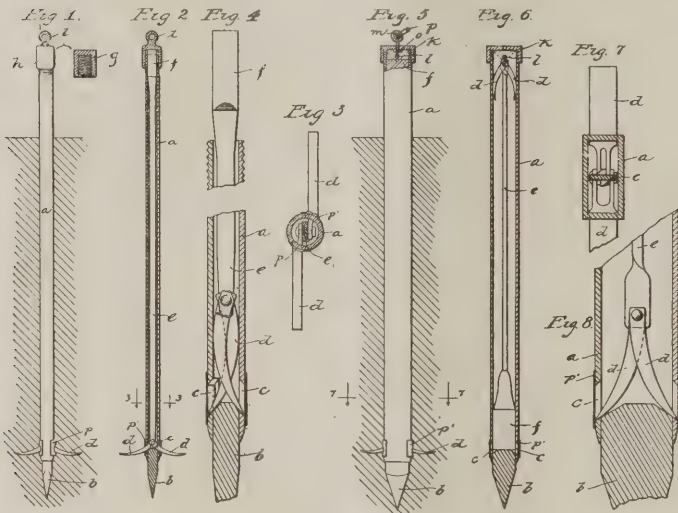
Then he hung up the receiver and sent a wire.

A RAPIDLY GROWING PLANT

THE Clinton Telephone Company, operating in Wilmington and several other cities in Ohio, has just issued a new directory, which shows it to be the possessor of a remarkably fine system, and one that is multiplying daily. The company now has, according to the new book, 1,246 subscribers, 673 connected to the Wilmington Exchange, 237 in Sabina, 104 at Blanchester, 94 at New Vienna, 85 at Martinsville and 53 in Clarksville. These, with its 18 toll stations and 12 public pay booths, give it a total of 1,276 telephones in the county, or one for every nineteen persons.

Patents

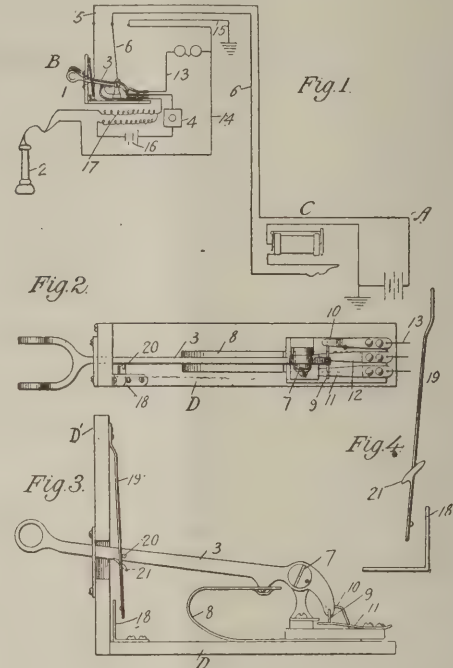
Hart F. Farwell, of Astoria, Ill., patents (No. 707,683, August 26, 1902) and assigns to the Country Home Telephone Manufacturing Company, of Chicago, an anchoring post for guying telegraph and telephone lines in which the improvement consists in the provision of retaining means passed through the post after it has been driven into the ground to constitute a lateral obstruction preventing the vertical displacement of the post. A tubular post is used into which a bar carrying a pair of hinged claws is inserted and this bar being driven down the claws spread through apertures in the side of the post and engaged firmly in the ground. The drawings thoroughly illustrate the device. The preferred form is shown in Figs. 5, 6 and 7, in which



a tube of oblong cross-section is employed permitting the use of broad claws of great holding power. The bar *e* is put in the tube upside down first, the butt end serving to prevent the admission of dirt through the apertures *c*. These apertures are usually covered with plates of thin metal through which the claws are driven when the post is set and the bar *e* reversed is driven home. Each post is provided with a hammering cap *g* in Fig. 1 and with an anchoring cap *h*. In the oblong form a single cap *k*

serves both purposes being bolted to the post by *l* and having the removable ring *m* secured by the nut *o*. Figs. 3 and 7 show the hinged joint of the two different styles of claws.

Albert B. Chance, of Centralia, Miss., patents (No. 707,761, August 26, 1902) a circuit-closing for telephones having for its object to dispense with the use of a generator at the sub-station for calling central and to provide means actuated by the receiver-hook for calling central and for automatically throwing the drop or annunciator at the central office to secure a positive ring-off.



Referring to the drawings the essence of the invention consists in the contact-maker 19, making contact with plate 18 when pressed forward by the pin 20 on hook 3 riding on the cam surface of inclined plate 21 when the hook is depressed. When the hook rises 20 passes below 21 and pushes 19 away from 18. The usual change from ringing to talking circuit is made at the back of the hook by the bridge-piece 9 and the springs 10, 11, 12. Line wire 5 is connected to plate 18 and wire 6 to the centre of hook 3. After taking the receiver off the hook the subscriber presses the hook all the way down, closing 19 on 18 and thus completing the battery circuit through the drop *C*. On releasing the hook pin 20 passes under cam 21 and pushes 19 back. When the receiver is restored pulling 3 down 20 again rides over 21 pressing 19 again on 18 and thus causing the ring-off signal to be given automatically.

THE FARMER'S DEMAND FOR TELEPHONE SERVICE.

FROM Cedar Falls, Ia., comes the information that the local telephone company operating in that city and vicinity, cannot supply the demand for telephones. This lucky company is the Cedar Valley Telephone Company, and by giving the very best service and at the lowest rates, they have built up a splendid clientage. In connection with the farmer's telephones, for which the demand is especially pressing, this story is reported. One farmer ordered a telephone for his home, and after waiting what he thought was a reasonable time, he drove into town and called upon the manager of the company.

"What's the matter with your old telephones anyway," said the irate farmer. "I ordered one for my home weeks ago, and none of your men have ever come near the place."

The manager in the suavest manner possible, told him that the company was very busy, but would make his case special and rush the work of installing telephonic connection. This finally quieted the rural subscriber, and he left the office.

About a week later, however, he again visited the manager: "You people here don't seem to care whether I get my telephone or not," he said, as soon as he set eyes on the overworked manager. "Now I'm here to stay until I see you make a move to wire my house for that telephone. I'm not going out of this office until you do something."

The manager was in a quandary, but finally hit upon a happy thought. He again explained how busy the company was; how they were installing instruments as rapidly as possible; what difficulty they had in getting sufficient help; and wound up by saying: "Now I'll give you \$2.00 a day to put on a pair of climbers and go out and work as a lineman, and help put your own telephone in."

With that the impatient subscriber decided to wait a little longer as he was convinced that the manager was telling the truth about the scarcity of help and the demand for service.



New Companies

COVINA, CAL.—The Home Telephone Company, of Covina, has been incorporated. The directors are J. O. Houser, J. D. Reed, H. M. Houser, C. E. Crawford, and P. T. Spencer. Capital stock, \$50,000; amount subscribed, \$10,000.

BLOOMINGTON, ILL.—The Salt Creek Mutual Telephone Company has organized, with G. W. Tracy, president; J. R. Hull, secretary, and John Martin, treasurer.

JEFFERSON, IA.—Farmers of Jackson township held a meeting here recently to organize a telephone company southwest of Jefferson. Officers were appointed as follows: President, John Alberts; secretary, H. J. Jensen; treasurer, G. H. Smith.

HOWELL, MICH.—Livingston County farmers held a meeting here recently for the purpose of organizing and incorporating a rural telephone company. These officers were elected: Frank Backus, president; Normay Wilson, secretary, and E. W. Hardy, treasurer.

KEYTESVILLE, MO.—A mutual telephone company has been organized here to be known as the Three M Telephone Company. Geo. Earl is president; Otis Phillips, vice-president; Dr. West, secretary; S. A. Richeson, treasurer, and Wm. Veal, Henry Phillips, Chas. Akers and Thos. Graves, building inspectors. The line will run from Marceline to this place, and will be met by a line from Mendon. Another line will probably be constructed from Westville via Trade.

FREMONT, NEB.—The Fremont Telephone Company has been incorporated, with a capital stock of \$200,000. Its incorporators are: J. L. Laird, B. W. Reynolds, J. R. Henry, W. E. Lee, W. J. Courtright, W. J. Davies and J. H. Williams.

JERSEY CITY, N. J.—The Monmouth Toll Line Company, with headquarters at Jersey City, has been incorporated, with a capital stock of \$100,000, divided into 10,000 shares of a par value of \$10 each; incorporators, George Evans, Jersey City, 2,500 shares; Henry T. Atkinson, Newark, 500 shares; C. Frederick Lang, Jersey City, 500 shares. The company is to build and operate a telephone system in various towns and villages, and particularly in Monmouth County.

SERGEANTSVILLE, N. J.—The Merchants' and Farmers' Telephone and Telegraph Company, principal office Sergeantsville, has been incorporated, with a capital stock \$10,000. Incorporators: William Strouse and Wesley D. Bodine, Sergeantsville; Charles M. Reading, Frenchtown, and William C. Gebhart, Clinton.

MADISON, WIS.—The Williston Telephone Exchange of Madison, Wis., has been incorporated to build and operate telephone lines in the city of Williston, Williams County, North Dakota, and throughout Montana, North Dakota and Wisconsin; capital stock, \$25,000. Incorporators: Dr. D. B. Collins, Susie S. Dow and George Dow, Jr.

Legal

RALEIGH, N. C.—An employee of a telephone company who attempts to string wires over those of an electric light company is held, in Mitchell vs. Raleigh Electric Company (N. C.), 55 L. R. A. 398, to have a right to presume that the light company has complied with an ordinance requiring its wires to be insulated, and to be bound to look for patent defects only.

PROSPECT, O.—The Marion County Telephone Company has begun proceedings in the Probate Court against this village to secure a franchise for the building and operation of a telephone plant here. The plaintiff relates in its petition that it has applied on three separate occasions, Aug. 4, 18 and 22, to the village Council for a franchise and has been refused, the company and counsel being unable to agree on the terms of a franchise. The plaintiff asks the court to grant a franchise and for all proper relief.

Financial

ELBOW LAKE, MINN.—The Elbow Lake Telephone Company has filed an amendment to its articles of incorporation, increasing its capital stock from \$16,000 to \$50,000.

JANESVILLE, WIS.—Fifteen stockholders of the Badger State Long Distance Telephone Company, representing nearly all parts of the system, met here recently and arrived at the conclusion to allow the mortgage to be foreclosed and the property sold, which will doubtless be done inside

of two months. A pool was started to raise money to bid in the property, and \$10,000 was subscribed. All stockholders will be invited to join the pool. It is thought there will be no serious trouble in raising the funds. Those attending the meeting were satisfied that the income is sufficient to make the investment pay. The stockholders and the bondholders will work in harmony in closing up the affairs of the old company.

Rates

OSHKOSH, WIS.—The Wolf River Telephone Company has increased its toll rates and the Little Wolf River Telephone Company has also readjusted its rates. There will be no increase in price, but the time limit for calls will be reduced. Heretofore a call has not been limited, but now the rates will be for conversations not to exceed three minutes.

Elections

KINGSTON, N. Y.—The annual meeting of the Citizens' Standard Telephone Company has been held here. The reports of the officers show that the year has been prosperous. Most of the earnings have been spent in bettering the system. Over 25,000 feet of cable have been put into use in Kingston. A new 100-drop switchboard of the latest improved pattern has been installed in the Rosendale exchange. During the year connections have been made with 21 additional points, making the list of places to which subscribers can talk as follows: Blooming Grove, Central Valley, Chester, Cornwall, Cornwall-on-Hudson, Esopus, Greycourt, Highland, Highland Mills, Marlborough, Milton, Monroe, Mountainville, Newburgh, Oxford Depot, Poughkeepsie, Salisbury Mills, Turners, Vail's Gate, Washingtonville, Woodbury Falls, Allaben, Arkville, Big Indian, Binnewater, Boiceville, Brodhead's Bridge, Brown's Station, Bushnellville, Fleischmanns, Griffin's Corners, Halcottville, High Falls, Hunter, Jewett Center, Kelly's Corners, Kripplebush, Lexington, Margaretville, Olive Bridge, Phoenicia, Pine Hill, Port Ewen, Rifton, Rondout, Rosendale, Shandaken, Shokan, Stone Ridge, Stony Hollow, The Corner, West Hurley, Westkill, West Shokan, Woodstock. The following were elected directors of the company: T. M. Brush, I. H. Griswold, S. B. Rawson, Elyria, O.; Howard Hendrickson, Albany; Charles A. Shultz, Mortimer C. Drake, Jay E. Klock, Kingston. Inspectors of election, D. G. Atkins and F. D. Winnie. The directors met subsequently and elected the following officers for the ensuing year: J. E. Klock, president; Chas. A. Shultz, vice-president; Chas. Reynolds, Jr., secretary and treasurer.

UPPER SANDUSKY, O.—The officers and stockholders of the Upper Sandusky Telephone Company held a meeting recently and increased the board of directors to nine members. The board is now composed of the following: G. W. Hale, M. H. Brinkerhoff, C. D. Juvinall, T. E. Beery, Anna Osborn, J. J. Hulse, D. L. Ingard, W. A. Gibson and H. H. Newell. G. W. Hale was elected president, D. L. Ingard, vice-president, M. H. Brinkerhoff, secretary, T. E. Beery, treasurer, and C. D. Juvinall, manager. The company has increased its list of subscribers over 75 per cent. during the last year and at present is engaged in installing over 200 new telephones in the county.

Franchises

NEW DECATUR, ALA.—The Southern Construction & Telephone Company, with headquarters in Toledo, O., has asked for a franchise to put in a telephone system here.

OAKLAND, CAL.—At the sale of a franchise for an Independent telephone company here, the following bids were received: Frank D. McBeth, \$1,050; George C. Sergeant, \$5,010; F. W. Ely, \$2,025; W. A. Beasley, \$1,575; F. Jacobs, \$15,010; Independent Telephone and Telegraph Company, \$1,000. After these bids had been read, H. C. Stillwell came forward and bid \$20,000. He refused to tell who he represented or give any information. It is said he made the bid for the Sunset Telephone Company. To give time to inquire into the several propositions, the City Council postponed action on the bids.

MONROVIA, CAL.—At a recent meeting of the City Council the clerk was instructed to offer for sale a fifty-year franchise for the erection and operation of a telephone system in the city. The terms of the franchise require the paying into the city treasury of 2 per cent. of the earnings of the business, after the first five years. This franchise is offered for sale at the request of D. E. Journal, who for the past two years has been operating his telephone business under a permit. The franchise will be granted to the highest bidder.

THE WEEK'S MESSAGES *Continued*

SAN BERNARDINO, CAL.—The Board of City Trustees has granted the petition of C. F. Guthridge, of Los Angeles, for the sale of a franchise for a new telephone system. The franchise was at once ordered advertised for sale.

COLORADO SPRINGS, COLO.—The Citizens' Telephone Company has asked the City Council for a franchise to operate in this city. The company has a heavy financial backing and offers a \$40-a-year rate for telephone service to business houses, \$50 for hotels and \$24 for residences.

DENVER, COLO.—An ordinance has been introduced in the City Council granting a 20-year franchise to the Independent Telephone Company. If granted, the company will establish a plant to cost \$150,000 and pay the city 1 per cent of the gross earnings.

EAST PEORIA, ILL.—The Citizens' Telephone Company, of Pekin, has been granted a fifteen-year franchise by the village of East Peoria. A line will be built from Pekin to East Peoria and from there connections will be made with Lacon and Independent lines to the east of the village.

EVANSVILLE, IND.—The Cumberland Telephone Company has been given ninety days' time in which to quit business in this city. Its franchise expired over two months ago.

ANN ARBOR, MICH.—Shelly Hutchinson has asked the City Council for a telephone franchise, and the application has been favorably received. An ordinance granting a franchise has passed first reading. The franchise is to run thirty years, and the city is to have the right to purchase the system after ten years, provided they give six months' notice of their intention to purchase, failure to give such notice to put the purchase off for five years; the toll rate to Detroit to be 10 cents for the first 2½ minutes; the system to have 400 subscribers before work is commenced; the franchise to be binding on the new company if the system is sold, or on the combined companies if it is consolidated with another; the system not to be sold to any telephone company now in operation in the city so as to stop legitimate competition.

HASTINGS, MINN.—The Consolidated Telephone & Telegraph Company has been granted a franchise here.

RENSSELAER, N. Y.—The Rensselaer Telephone and Telegraph Company, which is constructing a plant in Troy, and will build lines to cover Rensselaer County, has asked for a franchise to construct and operate a system here.

NEW BERN, N. C.—The International Telephone Company of America has accepted the franchise granted it by the City Council. It will in a short time commence work putting in an underground system. This company installs telephones free of rental, but charges two cents for each call. It will put in 1,800 telephones.

POMEROY, O.—At a recent meeting of the City Council a communication was read from G. V. Lasher, president of the Citizens' Telephone Company, in regard to a franchise for this company in Pomeroy. The only obstacle in the way of granting a franchise to the company is the fact that it is not incorporated. M. C. Smith was present in behalf of the Citizens' line, and stated that the members of his company were ready to comply with whatever the Council might demand.

Combinations

SARATOGA, IND.—It is rumored that the Union City Telephone Company is about to purchase the Branch Independent Company, running from Saratoga to New Pittsburgh, Salem, Salamonie and Fort Recovery. It is preparing to extend this branch line to Boundary and Ridgeville.

DANVILLE, KY.—The Bastin Telephone Company, of Lancaster, has leased the Van Winkle telephone lines in Boyle and surrounding counties. A number of new metallic circuits will be put in. Within thirty days arrangements will be made for connection with Louisville. The East Tennessee Telephone Company is putting in a copper circuit between Danville and Frankfort.

JOPLIN, MO.—The Mineral Belt Telephone Company, embracing the systems in Joplin, Webb City, Cartersville, Carthage and Oronogo, Mo., has been sold to a syndicate headed by Theodore Gray of Macon, Mo., for \$250,000. Improvements to the extent of \$100,000 are to be made on the system.

GENEVA, N. Y.—The Consolidated Telephone Company, with headquarters in Buffalo, has absorbed the Geneva Telephone Company. The deal was made last October, but it was not announced until recently, when representatives of the company came down from Buffalo for the purpose of interesting Geneva capitalists. They met with considerable success. The Geneva Company will be capitalized at \$75,000, a majority of the stock to be held by the Consolidated Company. The local company has an automatic system and about twelve miles of wire. The system will be changed, the old telephones being used, and cables used instead of the aerial wires.

HAMBURG, N. Y.—There is a well-founded rumor that the local telephone company has sold out to the Frontier Company of Buffalo. The officers of the local corporation, however, will neither affirm or deny the rumor.

Underground

ST. AUGUSTINE, FLA.—The Barwick Telephone Company, which will construct a telephone system, will probably have to put its wires in underground conduits, as an ordinance to that effect will be introduced in City Council.

EVANSVILLE, IND.—As soon as the telephone question is disposed of here, an ordinance will be passed calling for all overhead wires to be put underground.

WOOSTER, O.—An ordinance has been passed by the City Council requiring all telephone, electric light and other wires to be placed in underground conduits.

Construction

ARCADIA, FLA.—Arrangements have been made by G. M. Heitman, manager of the Lee County Telephone Company, of Fort Myers; R. E. White, manager of the De Soto County Telephone Company of Punta Gorda and Ed. Scott, manager of the Arcadia Telephone Company, to connect the three lines. The three exchanges will cover a range of territory of about 100 miles in length and 25 miles in width. The work is being rapidly pushed and will be completed at an early day.

MARIANNA, FLA.—The Marianna Telephone Company is extending its line to Cypress, Chipley and Graceville.

BLACKHAWK, IA.—The Black Hawk Farmers' Telephone Company is stringing wires for more telephones to be put in.

SALEM, IA.—The Salem Telephone Company's line is completed to Oakland, and in a short time will reach to Mt. Pleasant.

WELLSBURG, IA.—The Farmers' Mutual Telephone Company, known as the Snittjer-Lutjens line, has made arrangements to connect with the Wellsburg telephone line. The Cedar Valley Company also has signified its willingness to connect with the Wellsburg line. It is possible that a commercial wire will be strung to Grundy Center, although no definite arrangements have yet been made.

ALEXANDER, KY.—Arrangements are being made between J. T. Alexander, the owner of the Alexander line which enters Smithland, and the People's Independent Telephone Company, of Paducah, which it is thought will result in a consolidation or some other plan by which the lines may be connected. Mr. Alexander, R. E. Ashbrook and H. S. Crum, who represent the Paducah Company, have viewed the route over which the connecting line will be built should the deal go through.

ELIZABETHTOWN, KY.—The Hardin County Telephone Company will rebuild its line from here to Cecilian. The old line is almost entirely worn out.

HAZARD, KY.—A telephone line will be constructed from here to Hindman. Business men of the latter place have subscribed over \$800 for this purpose.

MARSHALL, MICH.—The Marshall Telephone Company, recently organized, started giving service on September 1. It has already secured nearly 400 subscribers. F. A. Stuart is at the head of the concern.

SPARTA, MICH.—The Sparta Telephone Company will construct a number of farmers' lines in the near future. It is making arrangements to greatly enlarge its capacity so as to take care of its very large development.

KELLOGG, MINN.—The Great Western Telephone Company is building a telephone line from Kellogg to Wabasha connecting Warbasha and Kellogg with Plainview and thence to Winona.

SWANVILLE, MINN.—John Stroman, owner of the Morrison County Telephone Company's system, has thirty-eight miles of line in operation, extending from Swanville to Upsala, Elm Dale, Ledoux and Little Falls. He is planning an extension of eighteen miles from the present line to Holdingford and Albany.

EXETER, NEB.—A telephone line is being constructed from Exeter to the surrounding country, connecting a number of farm houses with the Exeter exchange.

HOLMESVILLE, NEB.—The Gage County Independent Telephone Company, with central office at Blue Springs, has sixty-five telephones working on its four-party lines that have been put up in less than ninety days. Other lines are to be built, and arrangements are being made to connect with the Liberty Independent lines which cover southeast Gage County, and north Marshall County, Kansas.

MEADE, NEB.—The Golden Rod Telephone Company is constructing a telephone system here.

WAPPINGERS FALLS, N. Y.—The Dutchess County Telephone Company is building its new system in this place, under the provisions of the franchise recently granted.

THE WEEK'S MESSAGES Continued

MINOT, N. D.—The telephone plant here is to be greatly enlarged, in order to take care of the large increase of business.

TIRO, O.—C. R. Callaghan, general manager of the telephone system controlled by the syndicate headed by Jay F. Laning, is here making arrangements for constructing about 25 miles of farmers' lines in this vicinity.

BRISTOL, PA.—The Standard Telephone Company will establish connections between Bristol and Burlington, N. J. A crew of men has been at work for several weeks planting poles and stringing wires in the Jersey city. A cable will be run across the river.

HOUSTON, TEX.—The Citizens' Telephone Company has nearly completed the work of placing conduits throughout the central portion of this city. The Citizens' Company is now reaching out to long distances, and has about 200 stations. It is building through Indian Territory and expects to reach Kansas City in about six months. The company also intends to reach all of the most important towns in Texas within the coming year. It expects to connect with new exchanges at Paris, Sherman and Denison in a short time. These stations and the 200 above mentioned have all been connected during the past four months. The switchboard capacity of the Citizens' Company is now about 5,600 telephones.

WACO, TEX.—The Orange Telephone Company is preparing to make extensive additions to its system here, which has grown beyond all expectations. Ten thousand feet of new cable is to be strung at once to accommodate the large number of new telephones.

MARSHFIELD, WIS.—The Marshfield Telephone Company will move its exchange to a new building about November 1. Mr. Marsh, the owner of the system, is contemplating the installation of a full metallic, central energy system in the near future.

Miscellaneous

BIRMINGHAM, ALA.—The People's Home Telephone Company has recently put in a new switchboard, with new instruments and extensions, and installed new exchange, at a cost of \$75,000.

ELKO, GA.—A local company is placing telephones in the stores and residences here.

CARLINVILLE, ILL.—George Smith, of Gillespie, was here on business with the Carlinville Telephone Company. The enterprising people of Gillespie have organized a telephone company and will establish a local exchange at that place at once and will seek to get connection with the county site over the Carlinville telephone system.

CARLINVILLE, ILL.—The Macoupin Telephone Company has connected its line with Chesterfield, and gives subscribers here free connection with that point.

DE KALB, ILL.—The poles are set for a farm line from Malta to Lee. A number of applications for telephones have been received. This will make 1,020 telephones in the county in the DeKalb County system.

NEWBERN, ILL.—The new telephone line has been completed and connects Newbern and McClusky and Paradise neighborhood with Jerseyville and Kane.

STREATOR, ILL.—The Independent Telephone Company has completed its line to Grand Ridge and established an exchange in that town. For the present, no toll will be charged between that point and Streator, nor for the telephones in residences along the route.

WELDON, ILL.—The Farm and City Telephone Company has established an exchange here.

CHURUBUSCO, IND.—The Churubusco Telephone Company has 109 city subscribers and the same number on its farm lines. It has full metallic circuits to Green Center, Ege, Ari, Blue Lake, Eel River, Collins, Noblesville, Round Lake and Wesley Chapel, as well as long-distance lines, by which communication can be had with almost every town in the State, and all boundary States.

FAYETTE, IND.—The Fayette Independent Telephone Company has extended its lines into every township in Howard County. There are considerably over 1,000 telephones in operation. The system connects with all surrounding towns and counties. This company and the Glasgow Company thoroughly cover the county.

BONAPARTE, IA.—The Union Telephone Company expects to have six country lines running into Bonaparte by winter.

NORA SPRINGS, IA.—This place now has telephonic connection with all the surrounding towns.

MORAN, KAN.—The toll line of the Moran Telephone Company to Bayard has been completed. A charge of ten cents will be made for all communications between here and Bayard.

PITTSFIELD, MASS.—It is understood that the new Berkshire Telephone Company will have considerable preliminary work to attend to during the fall and winter, and will therefore not begin to build their lines in Pittsfield until spring. An officer of the company says that franchisees

are assured them in Chatham, N. Y., State Line, Richmond and West Stockbridge, and he has no doubt but what similar permits will soon be granted in North Adams and several towns in Berkshire County.

SOUTH HARPSWELL, ME.—The telephone wires have been strung from Brunswick to South Harpswell. The line was started early last winter, but owing to difficulties has just been completed.

ST. JOHNS, NEW BRUNSWICK.—Mr. Thompson, who is president of the New Brunswick Telephone Company, said it might be later than Sept. 1 before the new telephone system would be working.

GUTTENBERG, N. J.—The Guttenberg Board of Council has directed Clerk Vanderbach to notify the New York and New Jersey Telephone Company that its poles will be cut down if all arrearages of taxes are not paid within two weeks.

BURLINGTON, N. J.—The Standard Telephone Company has made connections from Burlington Island park to Bristol and this city.

HADDONFIELD, N. J.—This borough is now connected with Camden by the Eastern Telephone Company's system, which is a part of the Keystone system of Philadelphia.

CORFU, N. Y.—A representative of the Independent Union Telephone Company, of Ohio and Buffalo, is in town negotiating for the right of way for a telephone line. The company purposes to connect the farming community with the village, where a central office will be located, as well as connecting with towns in the outside territory.

GLEN, N. Y.—Telephone connection has been made by the Glen Telephone Company with the following places: Mayfield, Northville, Sacandaga Park and Cranberry Creek.

MARYLAND, N. Y.—The Davis telephone line is nearly completed through the town of Maryland.

NAPLES, N. Y.—The Naples telephone exchange is in operation. There are about 50 subscribers at present.

PANAMA, N. Y.—The Home Telephone Company has a line to Panama connecting all the nearby towns.

BOLIVAR, N. Y.—The Friendship Telephone Company has completed its line from Friendship to Bolivar.

WELLSVILLE, N. Y.—The Wellsville Telephone Company has extended its line through to Stannards and Hallsport.

UTICA, N. Y.—Two contracts have been awarded for work on the building to be erected by the Utica Home Telephone Company.

ANETA, N. D.—The telephone line connecting Aneta, Mayville, Hatton and Northwood with Lakota and Petersburg has been completed.

OAKES, N. D.—The telephone poles for the new line connecting Oakes, Straubville and other places have been set and the wires strung.

WILLISTON, N. D.—The telephone exchange here is in active operation.

TOLEDO, O.—As the Central Construction Company's work of installing the Home Telephone Company's plant is about completed, and as the construction company has always recognized union labor, the Electrical Workers' Union has passed a vote of thanks to the company. The plant will soon be turned over to the Home Telephone Company.

ZANESVILLE, O.—J. F. Laning has been here, and it is rumored that he was negotiating for the purchase of the Zanesville Telephone system. This he would not affirm, but he said it was a good business proposition.

BIRDSBORO, PA.—The farmers' telephone line in the Conestoga Valley and Southern Berks is now in successful operation. About thirty-five miles of wire are in operation, and a majority of the farm houses within a radius of six miles are connected.

GOULDSBORO, PA.—The Scranton and Stroudsburg Telephone Company has extended its lines from Gouldsboro to Pocono Summit, and thence into Houser's Mills, a distance of seventeen miles. All the plants of the Pocono ice companies have been connected, and upwards of forty new telephones have lately been put in by the company.

Personal

ATLANTIC CITY, N. J.—G. S. W. Brubaker, superintendent of the Inter-State Telephone and Telegraph Company, is spending a few weeks at the Hotel Shelburne with his brother.

PITTSBURG, PA.—Fred. J. Heavens, district manager of the Federal Telephone Company at Charleroi, has been promoted to the position of superintendent of exchanges, with headquarters at the general offices in Pittsburgh.

CLARKESVILLE, TENN.—W. G. Nagel, of the W. G. Nagel Electric Company, is at Clarkesville, pushing the work on the new telephone system. Mr. Nagel is one of the incorporators of the new company which was recently granted a franchise here.

FAIRMONT, W. VA.—J. Walter Barnes has accepted a position as local manager of the Consolidated Telephone Company.

THE WEEKS MESSAGES Concluded

SPARTANSBURG, PA.—John H. Wright, the well-known newspaper publisher of Spartanburg, Pa., has retired from the newspaper business in order that he may give more attention to his Independent telephone interests, which have grown to such an extent as to require his entire time. Mr. Wright is interested in several Independent systems, among which is the Spartansburg Telephone Company, of which he is president and general manager. He is also at the head of a syndicate of Gorry and Warren capitalists who have just purchased the Warren exchange of P. H. Adams, of Erie, Pa. This plant has 300 subscribers connected. The new owners will at once spend several thousand dollars in extending the toll lines and rebuilding some of the cables. Inside of a year they hope to double their present list of subscribers.

TELEPHONE POPULAR IN IOWA

THE Hawkeye Telephone Company, Hawkeye, Ia., has a force of 150 men at work installing rural telephone lines in Polk and Dallas counties.

President George Bandy in telling recently of the success of his company, said, "With a force of 150 men in the field constructing mains and putting in instruments we are not able to satisfy our patrons. The farmers are roaring their heads off because we do not get to them faster than we are doing. The result is that we have taken our canvassers out of the field and will not try to make new contracts and secure a footing in new territory until we catch up with the business we now have in hand.

"We are going to cover Polk and Dallas counties with farmer's lines within the next few months and give our patrons all the advantages of the nearest exchanges and of our toll line connections, etc. Ultimately we hope to include a goodly portion of Central Iowa in our field. We are now working lines in nine counties in this part of the state."

Mr. Bandy, when the subject of a merger of the Hawkeye, Mutual and allied lines was talked of, said that he had nothing to say on that score.

The new toll line service to the east of the city, built by the Jasper county company, an ally of the Mutual and the Hawkeye, has completed its copper metallic return circuit service into Des Moines. This company has an all copper return circuit system between Des Moines and Colfax, Newton, Grinnell, Prairie City, Monroe, Pella, Oskaloosa, Ottumwa, Marengo, Marshalltown, Iowa City, Cedar Rapids, Muskatine, Keokuk, Burlington and all intermediate points.

DEATH OF GEORGE J. HOFFMAN

INDEPENDENT telephone interests of the Middle West have sustained a great loss by the death of George J. Hoffman, which occurred last week. Mr. Hoffman, who was a resident of Cleveland, O., was one of the foremost promoters of Independent exchanges in the country. He built up the Tuscarawas Telephone exchanges which have been very successful. At the time of his death he was manager of the Exchange Construction Company; vice-president of the United Banking and Savings Company; a director of the Ohio Savings and Loan Company, and a leading official in the Tuscarawas Telephone Company, besides being prominently connected with many other undertakings in Independent telephone.

TRADE NOTES

THE HIPWELL MANUFACTURING COMPANY, Chicago, has put on the market a new self-restoring switchboard drop which was designed to meet the demand for a simple, durable, self-restoring drop that would always be reliable, but at the same time not cause any wear on any part of the plug. The mechanism of the new drop is extremely simple. The insertion of the plug in the jack causes a spring to rise in passing over the ball of the plug. This spring in turn actuates the hook, which, working against the shutter, causes it to rise into a perpendicular position, where it is held in place by the armature lever. In the line drop a single coil in tubular form is used, thus eliminating cross talk. These drops and jacks are mounted in banks of five; they are removable individually, but are not mounted in units. In winding the coils No. 34 wire is used, the resistance being 125 ohms, unless otherwise specified. The clearing-out drops are wound to a resistance of 500 ohms and are bridged in the cord circuit. The cams are of a type that has stood the test of time and hard usage. The jacks are self-contained, with extra heavy broad springs of 18 per cent.

German silver. The plug-shelf is covered with one-eighth-inch leather, and the cord holes are bushed with brass. The 100-drop board manufactured by the Hipwell Company is equipped with any number of cams and cord circuits desired, but will be furnished with ten unless otherwise specified. The entire board is cabled up and all connections carried to a terminal board in the back of cabinet with connections numbered, corresponding to the jacks.

THE MEDORA MILLING COMPANY, Medora, Ind., carries an exceptionally large stock of selected, well seasoned chestnut poles, and the very best facilities for handling either small or large orders. Even with its large stock, the Medora Company is barely able to keep up with the demand for its poles.

THE EUREKA ELECTRIC COMPANY, Chicago, has just obtained a contract from the City of Chicago for furnishing telephone apparatus for the "Fire Alarm Telephone Service." This speaks very highly for the well-known Eureka apparatus, as this is the first Independent apparatus to be used by the City of Chicago. Previously only Bell apparatus was used exclusively. In this contract Eureka apparatus was selected after a competitive test with all the other leading makes on the market.

THE SWEDISH-AMERICAN TELEPHONE COMPANY, Chicago, has opened a branch sales office in the Stevenson Building, Indianapolis, with facilities to handle all orders. Mr. A. V. Overshiner is in charge here instead of President E. B. Overshiner, as was stated recently.

PLANTS FOR SALE

FOR SALE.—Whole or part interest in Telephone Exchange. Present yield, 20 per cent; additional installations, 25 per cent. Entire plant, \$4,200. Excellent territory. Address W. HOWARD MEARS, Kasson, Minn.

TELEPHONE PLANT FOR SALE—160 telephones, 100 miles of toll lines; excellent opportunity for extending business; will sell for \$12,000; pays 15 per cent. net on this amount. Address TELEPHONE CO., care of AMERICAN TELEPHONE JOURNAL.

WANTED

POSITION as Superintendent or Manager in Telephone System, either on line or in exchange, by a young man of strictly temperate habits. Best of references as to character and ability. Address BOX 21, Oneida, Ill.

POSITION in exchange of from 150 to 500 subscribers as wire chief or inside workman. Have had five years' experience in the telephone business and have thorough understanding of every branch; taking care of five exchanges at the present time. Address, WIRE CHIEF, care AMERICAN TELEPHONE JOURNAL.

POSITION in exchange of from 150 to 500 subscribers, as manager or assistant manager. Experience in construction and switchboard work; best of references. Address JAMES C. THURSTON, North Vernon, Ind.

WANTED.—Position as manager of exchange of 100 or 200 subscribers; or as inspector or traveling salesman for supply house. Eight years' experience; best of references furnished. Address G., Box 125, Monroe, Ga.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISSELL CO., Toledo, Ohio.

WANTED.—A good transfer boy to take care of 125 city and 130 country telephones. State lowest wages and experience. Address VIRGIL A. GEIGER, Churubusco, Ind.

SUPERINTENDENT of construction company, position as superintendent or manager of exchange of 1,500 subscribers or more; gilt edge references furnished. Address SUPERINTENDENT, AMERICAN TELEPHONE JOURNAL.

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KANSAS ASSOCIATION CONVENTION.

THE Kansas Independent Telephone Association met in convention at Kansas City, Mo., Thursday and Friday, September 11 and 12. The convention was originally to have been held at Topeka, Kan., about a month ago, but it was decided to set the date ahead in order to give more time for perfecting arrangements. The place of meeting was changed from Topeka to Kansas City at the suggestion of Messrs. Barber and Brailey, builders of the Home Independent telephone system at the latter place. The Association decided to accept the Kansas City invitation in order that the delegates might have an opportunity to inspect the Home Company's system, which will be one of the largest and most perfect in the Independent field.

When the convention met at the Coates House at 10 o'clock Thursday morning the large assembly rooms were filled with delegates. They came from all over Kansas and Western Missouri. The latter had been invited to attend because of the comingling of interests of the two States. It was indeed a representative gathering of practical Independent telephone men. It is a well-known fact that the eyes of all Independent telephone men are at present centered on Kansas City. This is the only

large city in this section of the country where the Independents have not an exchange in actual operation. The location of Kansas City is such that in order to secure the greatest development in long distance traffic, and thus build up the various local exchanges in a large section of the Middle West, the Independent telephone companies must have their lines run through Kansas City. It is the key to the situation there—the connecting link which must be established to secure the best results. Consequently, all Independent telephone men, and particularly those operating in Kansas and Missouri, have an intense interest in the success of the plant now being constructed at Kansas City.

The convention was called to order by President A. R. Champ-
lin, of the Association. He gave a brief review of the work that was laid out for the delegates, spoke encouragingly of the future and present outlook, and then introduced the Mayor of Kansas City, Hon. James H. Reed, who welcomed the association to the city.

A complete account of the proceedings, together with all the papers read, will appear next week in the AMERICAN TELEPHONE JOURNAL.

THE CENTRAL ENERGY SYSTEM FOR SMALL EXCHANGES— ADVANTAGES AND DISADVANTAGES.*

By J. J. NATE.

IN weighing the advantages and disadvantages of the use of central energy systems in small exchanges there is a field for considerable thought and discussion. It will not be my effort to convince you either for or against. I do propose, however, to go carefully over the situation, expressing my own views on the subject and leaving the paper open for discussion if it is found of sufficient interest.

In selecting exchange apparatus for small exchanges, many vital points are often overlooked by the purchaser. It is the manufacturer's object to sell his apparatus, and from the many arguments advanced by him a very fair amount of knowledge can be obtained as to the efficiency of the different systems in vogue. The American people are a progressive people, and in the rapid development of the Independent telephone field exchange owners have found it absolutely necessary to keep pace with the demands of their subscribers; this demand is limited to practically three conditions—rapidity of service, satisfactory apparatus and clear talking. This means modern equipment and construction, and our large exchanges everywhere are now equipped with central energy multiple switchboards and telephones. Many of the older exchanges in which the magneto system was installed are being reconstructed and equipped at the present time with complete central energy systems.

It is impossible to satisfy the subscribers of a large exchange by the continued use of a magneto system, but a change to central energy apparatus of course represents a large outlay, and, unfortunately, many of the exchanges organized some years ago established rates which handicap their advance; for that reason alone there are still a number of large plants to be equipped with central energy apparatus. Even many smaller plants—say from two to five hundred subscribers—were constructed at a time when their future growth could not be estimated; the earnings have been spent to keep up with the growth of the exchange, and now, after but five or six years of operation, many of these exchanges are in such shape that reconstruction is almost a necessity. And yet if the Independent telephone men hope to retain the support of the public they must equip their plants with new

and better apparatus. Added to this, in too many cases comes the cost of line reconstruction, so that after practically five or six years of service many exchange owners are called upon to invest additional capital, equivalent almost to their original outlay.

Coming now to the question of apparatus for use in small exchanges, we naturally ask where to draw the line or what constitutes a small exchange? We may say for the purpose of illustration that an exchange which we estimate will not grow beyond two hundred lines is a small plant. We will first consider the cost of the different systems. A magneto switchboard, starting with one hundred numbers, can be installed, including lightning arresters, cable and cross-connecting apparatus, for four dollars per line. A central energy switchboard, operated from a primary battery and with visual clearing-out signals, can be installed, including arresters, cable and distributing facilities, for six dollars per line. A lamp line signal and double supervisory signal central energy switchboard, employing two sets of storage batteries—one set being charged direct from the street mains, while the other is in service—can be installed, including full office equipment, for eight dollars per line.

Now which of these systems is it advisable for the purchaser to select? In a magneto switchboard we have apparatus which is permanent and in which very few of the parts require renewing, except as naturally results from wear and tear in service. In a magneto board of less than two hundred numbers the operation is not materially slower than in a visual signal board, because in exchanges of this size the operator has ample time to handle each connection promptly. The only difference in operation between the magneto and the visual signal central energy switchboard, as far as the operator is concerned, lies in the fact that in a visual signal board there are no drops to restore. These are all controlled electrically at the spring jacks, the insertion of the plug in the subscriber's jack cutting off the line drop and substituting on the cord circuit the clearing-out drop. The object of this visual signal clearing-out drop is to come into view while the subscribers are talking, and when the telephones are hung up at each end of the line the signal drops out of sight. The act of replacing the drop shutter does not really consume

*A paper read before the Kansas Independent Telephone Association Convention at Kansas City.

much time, because it is performed simultaneously with the reception of the order from the subscriber.

The next point to be considered is the cost of operating. In a magneto system local batteries are required at each subscriber's station. The life of open-circuit batteries in small exchanges we may estimate at one year, which would mean 35 cents per station for battery renewals, to which may be added the value of the inspector's time in making the periodical inspections required to guard against troubles in the battery circuit. In a central energy system the switch contacts in the instrument are so positive and the arrangement of the circuits are such that troubles in the subscriber's instrument are very rare indeed, so that instrument inspection costs much less than in the magneto system.

Battery renewals for a visual signal central energy exchange, for, say, fifty primary circuit batteries, represent an outlay not in excess of what the local battery renewals represent in a magneto system. A central energy system is absolutely reliable and modern, and as such appeals favorably to your subscribers; this is no small point to consider, because we are a nation of travelers, and we all take pride in our home industries and like them to be up to date. The frequent grinding of the crank incident to the use of the magneto system has been relegated to the past, except in toll-line work, and even here a change may be looked for before many years; in fact, central energy toll lines are now operated for a distance of thirty miles. Magneto apparatus can be considered as a thing of the past as far as exchange service is concerned.

A central energy switchboard is of still further advantage where toll lines terminate in the switchboard. Toll-line service is most exacting, and takes up a great deal of the operator's time, so that a visual or lamp-signal switchboard for the subscriber's equipment would save some time in the work of operating the board and makes the operator's work more straightforward. True, a special cord equipment is required for connecting the two systems together. The circuits, however, have been scientifically worked out, and the results are fully as good as if two magneto lines were connected together, so that this feature, which otherwise might be an objection, is removed. While a central energy system means a little more cost in the first installation, maintenance and repairs are no greater in the visual signal board than in a magneto switchboard, and where the rates make it possible to install a lamp line-signal board with double supervisory signals one might better employ this class of central energy apparatus because of its more effective work and of the advantage which a double light supervision gives to the operator in handling the service. Such a plant appeals alike to the exchange owner and to the subscriber. Central energy systems appeal particularly to the subscriber, from the fact that there is no effort required to call the operator. The mere act of removing the receiver from the hook performs that function, and with a double-lamp supervision, listening-keys could really be done away with because the lamps are so wired that the work of the subscriber is known from the moment he takes down his receiver until he hangs it up when through talking. However, as privacy in exchange service, so far as the operator is concerned, is not a requirement, there would be nothing gained by eliminating the listening-keys. Perhaps in the matter of interior installations in large business houses, where it is desirable that the operator should not know what is going on, privacy effected in this way might be desired.

Two sets of storage batteries charged alternately will last for a great many years. The current for a small exchange would cost about six dollars per month, or seventy-two dollars per year. Local battery renewals would cost about as much. In view of this fact why not install modern apparatus? Furthermore, the battery furnished with a 200-line board would be of sufficient capacity to operate four or five hundred lines, so that there would be no added battery cost with the growth of the exchange. This, of course, would mean that an added section would cost proportionately less to install than the first two hundred lines.

It is usual practice in a magneto system to equip the operator's transmitter with a gravity battery. The annoyances consequent upon failure to keep these batteries in proper condition are well known, and here again is quite an item of expense. The consumption of blue vitriol alone in a year's time is no small item, to say nothing of the care and attention required to keep the batteries at their highest point of efficiency. Oftentimes we are almost unable to hear the operator because the exchange transmitter batteries are practically gone. In a central energy system this condition cannot arise, and the annoyance and expense of maintaining gravity batteries are eliminated.

Taken altogether, in my opinion, the outlay of a few hundred dollars more for a central energy switchboard and telephones is money well invested. This does not necessarily apply to very small installations, of twenty-five or fifty numbers, because in plants of this kind there is rarely any one to give attention to the apparatus who is at all conversant with telephone matters, and some time necessarily passes before the person in charge gathers sufficient experience to know what to do when any part of the apparatus goes wrong.

In considering the difference in the time required to complete connections you must remember that though you are dealing with seconds, when those seconds are multiplied by a great number of connections it makes quite a considerable difference in the aggregate time spent on the connections, and time nowadays is valuable to us all. We can again consider here that in a central energy board we have relieved the operator of a great deal of manual work; this not only makes an operator more efficient, since each operation is simpler; but gives her some time to herself in which perhaps to look over the office, check up toll connections and so forth.

In the maintenance of a central energy visual signal switchboard there would be no greater expense in the matter of renewals, as the parts are no more delicate than those of a magneto board. In a lamp signal board, however, there would be the lamp renewals. This is not an expensive item, even in exchanges where the lines are almost constantly in service, because these lamps have an average life of from 500 to 600 hours, giving from three to five years of service. This applies more particularly to the line signals; the supervisory lamps consume slightly more current.

The wiring of a visual signal board, which is the one I recommend as the proper board for small exchanges, is simple and easily followed. The keys, cords, plugs and other apparatus are precisely the same as those used in a magneto board. One at all conversant with switchboard work could easily repair in a very few moments any part of the apparatus which might get out of order, and in a system of any size you are obliged to have some one in charge for the purpose of clearing lines, answering complaints and looking after the central office apparatus. Where your revenue is sufficient it is advisable to have a competent switchboard man.

There is no question in my mind as to the advisability of installing central energy apparatus; even though the exchange may be small and the rates comparatively low. Remember there are toll-line revenues to be considered, which help out the profits. These revenues were almost unknown during the first years of Independent telephony.

In a central energy system an operator can unquestionably handle more toll lines, do it more rapidly and with greater ease. If a magneto exchange of 200 lines requires the services of two operators, one operator with a little assistance can take care of the entire work of a central energy board, serving the same number of lines. Here you see you have another saving. It is claimed as against these advantages that there is a liability to crosses, serious enough to disable the entire work of the exchange, to disarrangement of the entire battery plant, or to short circuits, which might temporarily put the exchange or, at least, nearly all of its subscribers, out of service, and that in a magneto system this could hardly ever occur unless by a general blow-out of the lightning arresters. As a matter of fact, however, we do not know of any central energy exchange so far installed that has been put out of business by any of these conditions unless improperly protected against lightning or heavy foreign currents. The fact that all our large exchanges are central energy, aggregating a vast number of lines installed, is proof enough of the reliability of the system; so it would seem folly to argue a possibility which experience proves is not to be feared.

Summing up briefly the use of central energy apparatus in small exchanges, we have in its favor modern apparatus, quick service and the good-will of our subscribers. In the magneto system we have the out-of-date apparatus, the greater time consumed in service, the annoyances at the subscribers' station from local battery troubles, slower work on the operator's part, more wear and tear on certain parts of the apparatus and greater expense for maintenance. Consider further that there is not being constructed in the United States to-day a large magneto system, while the inquiries which we receive for quotations on central energy boards and the thousands of small central energy boards which are sold demonstrate that the central energy has found favor with the telephone manager.

LONG DISTANCE TELEPHONY—III.

By P. KERR HIGGINS

COPPER wire is now the standard for all toll lines, and it is bad practice to use a smaller gauge than .104 inch. It should be perfectly smooth, free from scales and flaws, and meet the following requirements: Elongation 9-10 of 1 per cent in five feet; number of twists in 6 inches, 40; conductivity not less than 98 per cent of that of pure copper; the weight per mile, for 104" (No. 12 gauge E. L. S.), 174 lbs.; breaking weight, 550 lbs. The following specifications are generally adopted:

General Conditions.—If more than 10 per cent. of any bundle of wire does not meet the conditions and tests, the whole bundle is rejected and is not submitted for further test. Each coil is drawn in one continuous length; free from joints; each coil must be wrapped in burlap, so as to protect it from injury in transportation; center of coil should be not less than 22 inches in diameter and the coil be properly tagged, said tag to show net weight, size of wire and the length of the coil. The wire should be uniformly cylindrical throughout.

Torsion Test.—Shall comply with the number of turns specified for each size of wire.

Length of Coil.—The minimum length of coil shall be 2,800 feet, and maximum 4,000 feet.

Testing.—All wire shall be required to pass the standard electrical test as to conductivity.

Elongation.—Must not exceed 1½ per cent.

The use of copper wire for telephone circuits was begun in 1884 and has been increasing ever since, until to-day it is used almost exclusively for city and toll line work. Copper wire must be handled with great care, as it is very susceptible to mechanical injury. Its tensile strength is in the hard skin produced by drawing, and once this is broken the strength of the wire is destroyed.

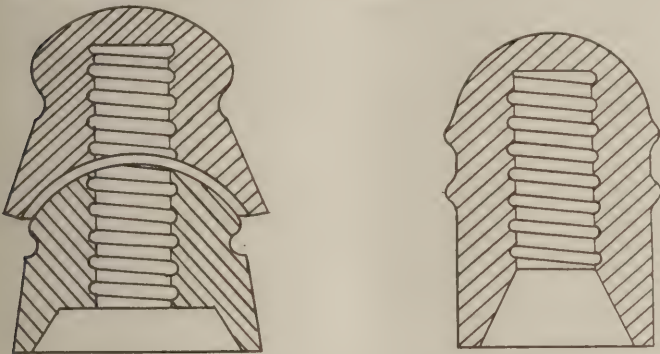


FIG. 9.

TRANSPOSITION SPECIAL INSULATOR. STANDARD TOLL LINE INSULATOR.

The hard skin is only 1-32 of an inch thick, so that the necessity for careful handling is apparent. Much of the damage and injury to copper wire is due to rough handling in building lines and in tying in the wire too tight on the insulator. The following table gives the principal requirements demanded in testing hard-drawn copper wire:

Diameter in inches.....	.104	.080
Elongation, %.....	.9	.8
Twists in 6 inches.....	40	35
Bends on itself.....	3½	3
Weight per mile.....	175 lbs.	110 lbs.
Resistance per mile.....	4.8	7.92
Breaking strain.....	555	350

GUY WIRE.

It is customary for toll line guying to use No. 6 B. B. galvanized iron wire and this should conform to the following requirements. It should be reasonably soft and pliable, cylindrical and free from scale, flaws, and imperfections and thoroughly galvanized.

Coils should be made up not weighing over 200 lbs., properly tagged with weight, size of wire and length of coil. Weight per mile should not be over 540 lbs. It must be capable of sustaining a tensile strain of not less than 1,600 lbs. In making tests of wire it is usual to use lengths of ten feet. All iron wire should be capable of being bent back and forward several times at right angles to itself without breaking; should stand a certain number

*Figs. 4, 6 and 8 were used in Article II, but are reproduced for the information of the reader.

of twists without splitting; pass a winding test (the wire being wound around itself a certain number of times), and it should fully conform to the breaking strain specified. In iron wire the elongation is high, being about 18 per cent., and it should stand from 20 to 25 twists in 6 inches. All iron wire should be galvanized to prevent rusting.

INSULATORS.

These are generally of glass and of two kinds (Fig. 9), single

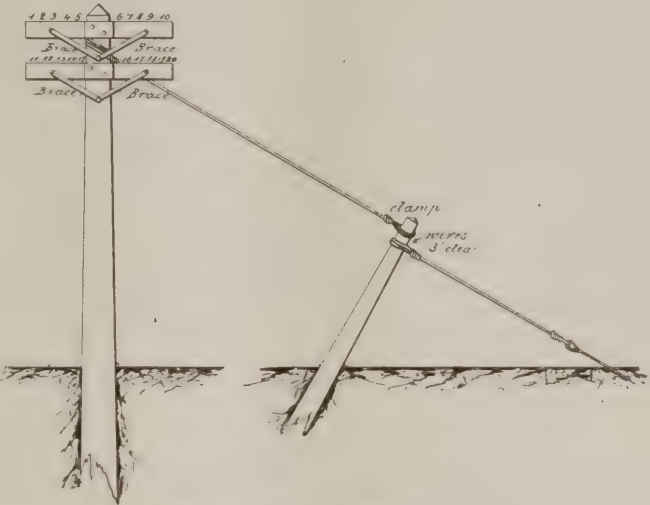


Fig 6 Method of Using Guy Stub.

*(See foot note.)

and double grooved, the former for use on the straight stretch and the latter for transpositions. The standard insulator is usually made of white or blue glass, 2½" in diameter, 4" high and weighs 16 oz. The transposition insulator is 3¼" in diameter, 4½" high and weighs 27 oz.; this usually comes in two parts, top and bottom, the two forming a transposition set.

BRACES.

Where cross-arms are used it is customary to brace them to the pole for safety (Fig. 6) and to keep the arm rigid. The braces are of galvanized iron and are generally 20" long, 1¼" wide and 3-16" thick, with a hole in each end.

POLE PROTECTORS.

These should be placed on all poles where there is any chance of the poles being used as hitching posts or any other injury likely to be done. These risks occur in villages in front of school-

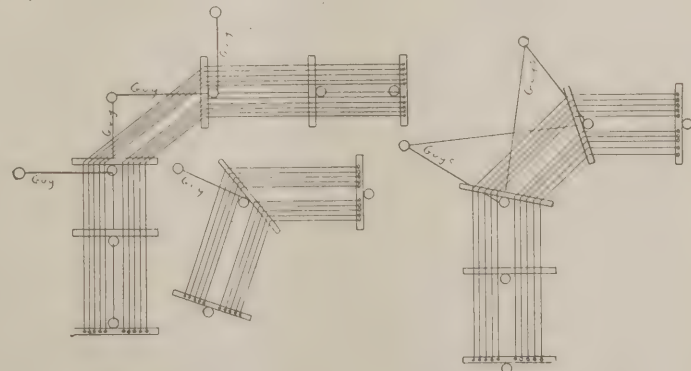


FIG. 4.—METHODS OF GUYING CORNERS.

*(See foot note.)

houses, etc.; the protectors are generally formed of strips of galvanized iron fixed 1½ inches apart.

GUYING.

No head guys are necessary on the straight line. Methods of guying are shown in various diagrams accompanying this article.

(See Figs. 4, 6, 8, 13.) In every case where brace poles are used they should be bevelled off sufficiently for the end to rest on main pole, and be fastened thereto by means of two lag screws (Fig. 5). All anchors should be so placed as to hold poles on a line directly opposite that in which it is pulled by the strain of the wires. In arranging guys avoid obstructing the road or private driveways. Guy stubs should not be used, except where anchor guys are too low to clear obstacles. When necessary to fasten guys to trees, etc., permission should be obtained from the owners and the trees protected by strips of wood placed between the tree and the wire. Guying in this way should be avoided wherever possible, as sooner or later it will cause trouble. When a pole line carries only one cross-arm, fasten the guy below this cross-arm; when more than one arm is used, attach the guy between first and second arm.

BRACKETS.

Where brackets are used, they should be placed opposite each other and so arranged that the wires will be 16" apart. The first

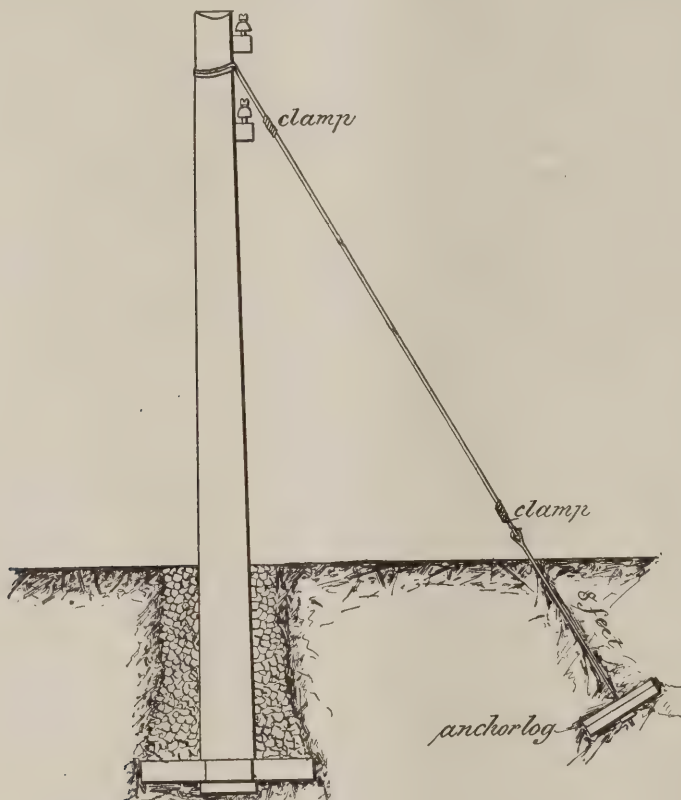


Fig. 8. Method of using guy.

*(See foot note.)

set should be placed about $7\frac{1}{2}$ " from top of pole and the sag of the span should not exceed 6 inches. At corners and curves the wire should be placed on the outside of the insulator. It is bad practice to place more than three circuits on a bracket line, as the wires get low down and the risk of trouble is great, and the appearance bad. Two kinds of nails are used for fastening the brackets, 30 D. and 60 D., one of each for each bracket.

JOINTS.

In making joints it is a safe rule to make them as nearly as possible equal in all respects to the line wire. The McIntire sleeve joint fulfills this condition and is the standard joint for all copper wire. It consists of a double copper tube of a slightly larger diameter than the wire to be joined. The wire is passed through the tubes (one end in each) and the joint twisted by means of special pliers, each end of the joint being clamped in the proper grooves in the pliers; $3\frac{1}{2}$ complete turns are made and the ends of the wire are bent upwards and cut off.

NUMBERING CROSS-ARMS.

Pins on cross-arms are numbered from left to right, looking towards some prearranged center; the numbers usually run from 1 to 10, or they may run in pairs.

TEST CONNECTORS.

For facility in testing it is found convenient to place test connectors at fixed points; these may be near the outskirts of a town or city and convenient to a railroad station. When so placed the wires at the test point should be "dead ended" and not carried through.

LIGHTNING RODS.

It is usual to place lightning rods on every eighth pole on a standard line of 40 poles to the mile, and proportionately fewer on lines carrying less poles to the mile. They should always be located in good wet soil, for they are absolutely useless in dry sandy soil or rocky ground. It is usual to use No. 9 or 10 B. B. galvanized iron wire for these, leaving a small coil of the wire in the ground at the base of the pole, and running the balance up the side of the pole (fastening it with fence staples) to the top. This feature of line construction is important, especially where lightning storms are frequent.

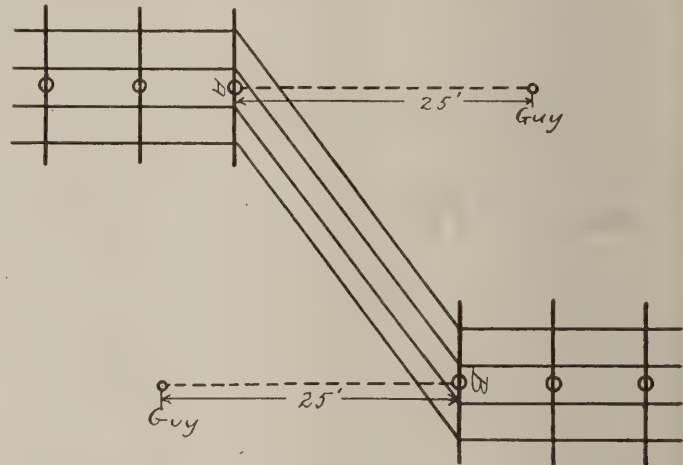


FIG. 13.—SHOWING METHOD OF GUYING AT ROAD CROSSING—ANGLE OF 45°. POLES A AND B SET 6' IN GROUND AND WELL BRACED UNDERGROUND.

SAG OF WIRES.

In stringing copper wire the following table will give some idea of the sag which may be allowed. It is seldom necessary to measure it, especially after one's eye has become accustomed to the proper sag.

	SPANS.			
Temperature.	100 Ft.	150 Ft.	200 Ft.	250 Ft.
50° F.	5 in.	10 in.	16 in.	26 in.
60° F.	6 in.	12 in.	17 in.	28 in.
70° F.	7 in.	13 in.	18 in.	30 in.
80° F.	8 in.	14 in.	20 in.	32 in.

It is important to note the temperature at time of erecting the line as a proper allowance of sag in relation to the temperature will affect the efficiency and appearance of the line later on.

A MILITARY FLYING TELEPHONE LINE

COMPANY M, New York State National Guard, in camp this summer at Peekskill, made a highly successful and interesting test of a flying telephone line. This test was not merely an experiment, but was used in a practical manoeuvre. Two scouts of Company M were stationed in a bomb-proof hut near the targets. They used the telephone line to communicate to the gunners the results of each shot.

No special arrangements or materials were provided for the test. An ordinary army wagon was provided with an extemporaneous reel, constructed by the company carpenters. The wire was coiled on this reel. Two horses were then hitched to the wagon and proceeded at a rapid trot for about three miles, the reel paying out the wire on the ground as the wagon proceeded. The wire was No. 14 B. & S., and was laid with as much haste as possible, care being taken, however not to obstruct gates or cross roads. The scouts laying the line were provided with portable telephones in special carrying cases, strapped to their backs. The line was laid so that they could bridge in at any place.

This experiment proved to the satisfaction of the commanding officer the adaptability of the telephone and the flying line arrangement to military purposes.

FOREIGN CURRENTS

THE report of the British Postmaster-General for the year ending March 31, 1902, just issued, deals extensively with the progress of the Telephone Department of the Post Office, which has done a large amount of work both in local and long distance telephony during the year under review. The total number of long distance circuits in use at the end of the year was 1,165, with an aggregate length of about 98,000 miles of wire. Out of the capital sum of \$11,500,000 authorized for the development of the long distance system the expenditure to date has been \$9,483,245, the work done during the year covered by the report having amounted to a little over a million dollars. These figures show that long distance telephony is being fairly actively developed in England, considering the size of the country, for the distances between important commercial centres are not nearly so great as in the United States. The total revenue from the long distance service was \$1,193,600, as compared with \$1,056,045, an increase of \$137,555 for the year. The average value of each long distance message was 11.36 cents, which figure gives some idea of the low rates for long distance telephone messages in England. It also shows that the average English long distance message does not travel very far, for the rates being based on a charge of about 25 cents per hundred miles, an average revenue per message of under 12 cents would indicate that the average message is between places less than fifty miles apart.

* * *

The much talked of London telephone system established by the Post Office is said to have proved itself so far a very successful undertaking. At the main exchange provision was made in the first place for the accommodation of 5,400 subscribers' lines, but the number of applications for service has been so great that arrangements have been made for the exchange equipment to be increased at once to its ultimate capacity of something over 10,000 lines. The report says that the central energy system has been a distinct success, and the results obtained have fully justified its adoption. The simplification of the subscribers' instruments and the abolition of the local batteries are some of the advantages of "central energy" dwelt on by the report. Attention is called also to the fact that the operation of the system is also much simplified and that the lamp signals, marking every stage of a connection, enable the operators to give a more rapid and efficient service to a greater number of subscribers. American adherents to the central energy system will endorse all of the Postmaster General's encomiums.

* * *

About ten new exchanges are being constructed by the Post Office in different parts of London, and several others are being planned for. According to the report, the only complaints against the Post Office system have related to the delay in making the necessary connections, as the work of connecting up subscribers has been very slow. The excuse for this is the magnitude and complexity of the work. So far about 600 miles of underground duct has been put down and 330 miles of cable, containing from 100 to 216 pairs of wires, drawn in. The distribution of these main cables by smaller cables and individual pairs of wires to reach the subscribers' premises has been an operation of much difficulty. The total capital cost of the system to the date of the report has been \$4,861,000, or nearly half of the ten millions authorized by Parliament in 1899 for the Post Office London system.

* * *

The Postmaster-General seems also to have discovered that the great era of telephonic development is now opening out—which is one of the favorite tenets of the AMERICAN TELEPHONE JOURNAL. He says that "the metropolitan system will, in the course of the next few years, have to be developed to an extent which would have seemed impossible a few years ago."

* * *

One of the London electrical papers points out in an interesting manner how the Post Office London system, which was expected to be an active competitor of the National Company's system, has really become rather a supplement than a competitor. The National Telephone Company has always had the shadow of 1911 (when its license expires) hanging over it—the shadow of an unknown fate at the hands of powers that had

never been too kind to it. To meet that contingency the company has not only built up a large reserve fund, but it has had to undertake its extensions with the greatest care as to their early remunerative nature, and the nearer it comes to 1911 the more cautious will the company have to be. That state of affairs, combined with the manner in which the company has been harassed and obstructed, has retarded the progress of telephony. Notably in London the field has not been tilled to its utmost extent, and unless the National Telephone Company were to be released from the fate of expropriation and from other troublesome burdens it could not hope for many years to come to meet all the immense possibilities of telephonic development in a city like London.

* * *

Hence there is plenty of room for the Post Office system. With free intercommunication between the two systems, each Post Office subscriber is practically a new subscriber to the National system. The company will, therefore, benefit directly by the successful extension of the Post Office system. The number of applications for connection to each of the systems is steadily maintained, and there seems nothing to hinder both organizations from pursuing the even tenor of a progressive way for many years to come. For a just view of the situation, however, it is as well to recognize the points of difference between the "rivals." The Post Office has all the benefits of the company's experience and of its numerous subscribers; it can lay underground lines wherever it pleases; it is aided in every way by the Government; it has not got to pay 10 per cent. of its gross receipts to a competitor; and it has no 1911. There is, therefore, at least a little ground for believing that if the National Telephone Company had been treated as well as the Post Office has been, the latter would have had a very little corner indeed of telephonic London to call its own.

* * *

In the above notes *Electrical Investments*, which, as its name denotes, is an electro-financial journal sums up in a very common sense way the situation that has resulted from the building of the Post Office telephone system in London. And this summing up illustrates most pointedly the absurdity of Government control of such an industry as telephony in which commercial management is absolutely indispensable if the best development is to be attained, and free and unfettered development is as oxygen to the human race. Americans who have studied the working and development of telegraphy and telephony in Europe, where Government control of both telegraph and telephone obtains in almost all countries, must be thankful that the question of Federal control of the telegraph and telephone in this country, while occasionally discussed in a purely academic fashion, has never been seriously considered.

The Arrester.

DESTRUCTION OF TELEPHONE PROPERTY

EVERYDAY, complaints are heard from telephone companies to the effect that their property is damaged or destroyed by maliciously or mischievously inclined youngsters and sometimes people old enough to know better. Insulators have been broken by small boys with stones; valuable cables have been put out of business by rifle bullets fired by careless persons, wires have been frequently broken in these or different ways, and the destruction of telephone property upon which so much now depends, often goes unpunished. The telephone company repairs the lines, and the matter is dropped. In Kentucky, so many telephone wires have been damaged and destroyed, and communication thus temporarily interrupted, that the law has been hunted up, and there is a general demand to have it enforced to the letter. The State of Kentucky provides the following statute for such offences:

Sec. 1231 Ky. Statutes.—"If any person shall willfully and maliciously injure, obstruct or destroy a telegraph or telephone wire, post or pier, or electric light or motive wire, or the material or property belonging to or attached to any or either of same, he shall be confined in the penitentiary not less than two nor more than ten years."

IN THE OPERATING FIELD

THE BELL COMPANY NOW WANTS ORANGE, CONN.

ORANGE, Conn., is a striking example of the fact that the Bell Telephone Company makes very serious mistakes. Orange is a small town near New Haven, situated in a thickly populated section of the very stronghold of the Bell Company. The citizens of Orange a few years ago asked the Southern New England Telephone Company to run a line to their village, establish an exchange there and give them telephonic service. This the Southern New England Company most emphatically refused to do. Whereupon several business men in the town organized a telephone company and built a system for local use. The exchange started out with thirty subscribers, each stockholder being a subscriber and building his own share of the lines. They obtained just the kind of service that they wanted, and every one was satisfied. The system, besides saving many times its cost in giving facilities for rapid communication, actually paid its promoters in cash. No more thought was given to the Southern New England Company. But the Southern New England Company then realized that it had made a mistake. It is now not only willing to give service in Orange, but it has actually approached the directors of the local company with a proposition to furnish service. It is clearly very anxious to add the subscription list that the local concern has built up to its own list of subscribers. It wants so badly to annex these Independents that it offers service at the startlingly low price of \$3 a year!

The Southern New England Company wants to put in a system, using its own instruments, and charging only \$3 a year. The stockholders and directors of the Orange Company cannot understand this proposition at all. They originally would have paid the Bell Company from \$20 to \$30 a year for the same service. The Bell Company said it saw no profit in those rates, and the Orange directors now cannot see why it is that the New England Company has come down to a rate of \$3.

The Southern New England Company is looking ahead. The Orange stockholders and directors also see into the future. They see this: A trolley line is to be constructed in the near future to Orange, connecting with New Haven and with nearly every town of any considerable size in that part of the State. When this is done the population of Orange will surely increase in a very large measure. More people will come and more work will be done. More telephones will consequently be necessary, as the telephone service is now absolutely essential to business. The subscription list of the Orange exchange will double and treble and grow beyond the wildest expectations of its most enthusiastic promoters.

This is the reason why the Southern New England Telephone Company is so extremely anxious to get control of the Orange system. It undoubtedly contemplates no charitable act, nor has it any special love for the residents of Orange, but because it sees the future possibilities of the place it naturally desires to control its telephone service. The stockholders and directors almost unanimously are indisposed to sell to the Bell Company. The latter has lost a golden opportunity—one more to its credit—and the promoters of the Orange Independent telephone system have gained one.

LEGAL WRANGLE OVER SERVICE

ACROSS bill has been filed by the Maryland Telephone Company, of Baltimore, in the suit of Leon B. Robinson, a druggist, against that corporation to secure an injunction restraining the telephone company from discontinuing the telephone in the plaintiff's place of business or from refusing to make or answer calls thereto, which in turn asks an injunction permanently restraining Leon B. Robinson, his agents or employees from permitting the use of said telephone by outside parties. The injunction against the telephone company was originally granted on August 6.

In the cross bill the telephone company takes the ground that the druggist has violated his contract by allowing the indiscriminate use of his telephone to outsiders, and inviting the public to use the same. The company claims that when agents went to the druggist to complain and to suggest the installation of a public pay station that they were threatened with bodily assault.

ALBANY HOME TELEPHONE COMPANY

ALBANY, N. Y., will soon have splendid telephonic facilities. The Albany Home Telephone Company which is promoted and backed by the Rawson syndicate, is pushing work on its system in the New York State Capital, and it is now stated that service will be given to about 2,000 subscribers the latter part of September or first of October. A fine exchange building is being erected, and a system installed which will be representative of every development and improvement known. The first sections of the switchboard are now being installed. The switchboard, when completed will have a capacity for 7,200 lines. Besides giving a splendid local service, the Albany Home Company will have toll line connections with all towns in that section of New York State, including Troy, Rensselaer, Cohoes, Waterford, Green Island, Schenectady, Gloversville, Johnstown, Saratoga, Glens Falls and Utica.

SECTION GANGS TO HAVE PORTABLE TELEPHONES

PORTABLE telephones are to be used by the Pennsylvania Railroad Company to expedite its passenger and freight traffic. Hereafter all foremen of section gangs and of other floating gangs of workmen will be provided with telephones equipped so that connection may be made at any place on the railroad line with headquarters and the dispatcher's office. When tracks are to be torn up or repaired or the tracks interfered with in any way, the person in charge of the work will connect the portable telephone with the train dispatcher, and notify that official that the track is broken. The dispatcher will govern the schedule of trains accordingly. Telephones are coming into more general use in railroading every day, and in the near future it is not improbable that all communication in connection with railroad work will be done by telephone.

GROWTH OF FARMER LINES IN IOWA

FARMERS in the State of Iowa have probably a fuller cognizance of the immense advantages to be reaped through the use of the telephone than those of any other State in the Union. The growth of what are commonly termed "farmer lines" or "rural lines" or "mutual lines" in Iowa has been unprecedented, and is quite unapproached by any similar growth in any other part of the country. In that State telephone systems have sprung up over night, figuratively, if not literally, speaking. It is the exception now rather than the rule to find a farm house, no matter how far it may be from centers of civilization, without the familiar jingle of the telephone bell.

A few years ago telephones were thought profitable or practical only in large cities. The farmers of the country were the very last class of people thought of as possible telephone users. But a few of the more progressive among them were thoughtful enough to foresee what a great boon telephone communication would be to farm life. They wanted telephone service. And if the company operating in the nearest city could not be persuaded to build lines and give them connection, they went to work and built the lines themselves, buying cheap instruments, stringing wires on trees, fence posts, and in many instances using barbed wire fences as part of the circuit. They wanted telephonic communication, and they wanted it cheap. And consequently cheap construction was the rule. This very naturally has involved rebuilding in almost every instance, for once a rural resident has been educated to the use of the telephone, he will never willingly do without it.

This work has gone on for the past few years in every rural community of the United States. But, as we have said before, it has been in Iowa that the fullest development has been reached. Nearly every county in that State has a complete network of telephone wires. Generally these rural systems are constructed by a dozen or fifteen neighbors, who only wish communication between themselves. But after the first taste they want connection with as many other people as they can reach. Hence lines have been run connecting the different farmer systems with each other, and other lines joining these connected systems with small exchange towns, and these in turn are connected with larger towns, and so on, until it is possible for a farmer in Iowa

IN THE OPERATING FIELD

to talk while sitting in his own home, not only with his near neighbors, but with nearly every other person in the State who has a telephone.

In Page and Fremont counties, it is estimated that 21,000 farmers are in telephonic communication, and new construction is being carried on day in and day out. In Page County, Clarinda is a central point for the interconnection of rural systems. Here, eighteen or nineteen farm lines center. In Bethesda, a small post office, with not more than a dozen houses clustered around it, many rural lines center, connecting to the mutual switchboard. In Yorktown, eleven of these lines center; in College Springs, Coin and Essex, seven lines run into each town; Braddyville, Shambaugh, Hepburn, Norwich and Northboro are each connected with two or more lines. Although the farmers can thus have direct communication with each other, it always takes a very long time to get a connection, as on each line there are anywhere from twelve to twenty-four or more subscribers, and there is hardly a minute in the day when some one of them is not using the line.

The various patrons on the line are called in a very tedious manner, the general method being a series of rings of different duration, using Morse signaling code. Thus one patron may be called by a short ring and a long one, or two long rings and a short one, or any combination of short and long rings. It can be imagined what endless confusion results from this, but still the farmers have telephone service, and that is what they most want. In a few years more it is safe to say that the rural lines will be every way as good as those now in use in the large cities. But the lines in use now are certainly very crude, although they answer their present purpose.

In Fremont County, Ia., a private corporation came forward and built the farmer lines, and as a result they are in much better shape than those of the class just described. But they have their drawbacks; for instance, they are more expensive to the farmer than to residents of cities, and cost the farmer for service three or four times as much as the mutual subscriber pays. But then, the telephone company looks out for all repairs, keeps the instruments in order, thus relieving the farmer of all this work, and giving him a better service. In Shenandoah rural lines are not so extensively used as in many other towns. But now a new company is building an exchange there, and three or four farmer lines are being centered at this exchange.

The field of usefulness of the farm telephone line is almost unlimited. It will buy or sell cattle, hogs, any kind of live stock, farm products, will call the doctor when minutes are precious, will hire help, bring repairs for a broken reaper, sell farm products before they are ready for the market, will get the top of the market price for anything, makes it possible for the farmer to be his own auctioneer, places the important news of the world and of his neighborhood before him as soon as it is received in the central exchange. It puts the retired farmer in touch with his children on the farm, enables him to keep watch of his tenants, and has many other uses, the list of which is growing day by day.

A WEST VIRGINIA INDEPENDENT RETROSPECTION

IN view of the toll line connections recently established by the United States Telephone Company between Ohio points and independent exchanges in West Virginia, it may prove interesting reading to give a short review of the beginning of Independent telephony in West Virginia, and also to glance at the present situation.

One of the very first Independent exchanges established in the United States was at Huntingdon, W. Va., by the Huntingdon Mutual Telephone Company. The construction, as was usual in the early days of the art, was very poor, — using grounded circuits, house tops instead of poles, and like slipshod methods. But it served its purpose. The Bell Company found its subscription list so cut into that it gave service absolutely free of cost for about three years. But, even thus handicapped, the Independent exchange grew and expanded. It educated the people to the telephone habit. It gave them a taste of good service, and they wanted better. This was in 1894. In 1899 new blood was infused into the Huntingdon Company, and the system was entirely rebuilt, using materials of the latest and best construction. The

plant now has about 1,000 or more subscribers, against 350 in 1898.

The Bell Company has recently installed a new central energy system in Huntingdon, and has about 269 subscribers on its list. It secured most of these through its long-distance service. Now the Huntingdon Company has long-distance service through the recent connections with the United States Company, and can give equally good long-distance facilities. The Huntingdon Company has toll lines established and under construction with all nearby towns, and is in a prosperous condition.

At Charleston, W. Va., the people becoming disgusted with the poor Bell service, and inspired by the success at Huntingdon, organized a company known as the Kanawha Telephone Company in 1895. This system was constructed even worse than the Huntingdon plant, and was constantly in need of rebuilding and repairs. Its affairs went from bad to worse until this year the Charleston Home Telephone Company was organized, and bought the Kanawha Company. A new exchange was built and opened in February, with about 350 subscribers. It now has about 800, and new ones coming every day.

This company and the Huntingdon Mutual Company have jointly constructed a first-class toll line between the two cities, and give a fine service. The Charleston Company also has connections through the United States Telephone Company with all outside points reached by the long-distance lines of the latter. The Charleston Company has agreements with all the small telephone companies running into the mining regions, and has thus built up a fine trade. It has secured a controlling interest in the Spencer, Walton & Clendennin Telephone Company, which operates a line running from Charleston to Spencer, in the direction of Parkersburg, to which point, it is hoped the line will ultimately extend.

In the western part of the State the Independents have fine exchanges. At Wheeling there is the Home Telephone Company; at Clarksburg, the Consolidated Telephone Company, and at Parkersburg, the West Virginia Western Telephone Company, and many others in other cities and towns of lesser importance. At the latter town, in the past week, the Bell Company has not increased its popularity. It has just finished rebuilding its exchange and installing a central energy system. In return for all this it sent out a circular letter to its subscribers, detailing all that had been done to better the service, and winding up by demanding a greatly increased rate of about 100 per cent. for service. The subscribers were indignant. They called a mass meeting, which was attended by nearly every subscriber in the town. Those at the mass meeting unanimously agreed to discontinue the use of the Bell Telephone. They also agreed to subscribe to the West Virginia Company. They will also make personal appeals to all not at the meeting, to do likewise. So, there is a favorable outlook for the West Virginia Western Company.

It has taken immediate steps to cope with this large inrush of subscribers. A bond issue of \$75,000 was at once authorized, and many of the bonds were purchased by the indignant Bell subscribers. Additional equipment will be ordered for the Independent exchange, and everything done to give a splendid service to a greatly increased number of patrons.

The three companies mentioned above cover almost the entire northwestern part of the State. Small companies of from 20 to 200 subscribers take care of the rural districts and have connection with the large companies.

TOLEDO HOME TELEPHONE COMPANY

TOLEDO'S new Independent Telephone system is reported as giving a service that gladdens the hearts of its patrons.

A charge for service was not made until the first day of September, and then the subscribers were willing to pay without a murmur. There are now 3,700 telephones connected, and nearly 5,000 more instruments installed, ready for connection. In a week or two, it is said the company will be more than earning its interest.

There is some back interest accumulated which will be charged to construction, and the interest coupons will be promptly paid when due in January. It is figured that the stock will pay a dividend about the first of next September. The stock sold recently at 25, and the bonds find a ready sale at 80. Insiders predict 50 for the stock early next spring.

Opinion and Comment

AIDS TO REVENUE

WE may as well frankly state at the outset that the object of this article is to provoke discussion and to draw out suggestions. The topic is "How to Increase the Revenue of a Telephone System." This is a subject that seems to us so far to have been utterly neglected by telephone men. Yet we cannot believe that telephone men will always be content with the present cut-and-dried method of running the telephone business, and will be forever unable to devise means of increasing the earning power of telephone systems. The local telephone system is probably the most uneconomical piece of machinery that there is. It has been pointed out that, taken in the aggregate, the average local telephone system is in active operation for about one hour out of the twenty-four. And it has no by-products and no off-shoots or by-services, as it were, by which additional revenue may be earned or the idle time turned to some account in helping to carry the burden of expense.

This seems to us to be somewhat of a reproach to those engaged in the telephone business. Surely the ingenuity which is capable of building, operating and managing one of the most complicated of modern business devices, should be able to suggest methods by which the local telephone plant could be made both more useful and more effective as a money maker, than it now is. True, the telephone business is comparatively young, and so far the prime object of supplying telephone service has been so absorbing and so profitable, that the search for by-products or by-services has not greatly engaged the attention of telephone men. But the public demand is for cheap telephony, and any measure having the result of increasing the earning power of the telephone plant will help to cheapen the telephone service proper.

Off-hand it is not easy to point out where the by-products or by-services of a telephone plant are to be found. Whatever ideas we may ourselves have on the subject, it is not our intention at present to divulge, for, as we have said above, our immediate object in writing this note is to provoke discussion, and extract suggestions from those of our readers who may have ideas on the subject. That the telephone will eventually follow other industries in this respect seems moderately certain. The gas plant originally supplied light only, but modern chemistry has made the production of gas almost a side issue of the gas plant, and, further gas is largely used for heating as well as for lighting. Electricity from a central station was first used for lighting exclusively, but the modern central station supplies current for power and heating, often in excess of the amount used for lighting. The steam railroad at first carried passengers only, but now it is the freight that pays the dividends, and even the trolley lines are taking to carrying freight. Now let the telephone chemists and far-seeing managers speak out and tell us where we are to find our telephonic by-product and extra services.

TOLL LINE DEVELOPMENT

IT is highly encouraging to notice that Independent telephone men are alive to the necessity of developing the toll-line business. Toll-line traffic over moderate distances is one of the most profitable branches of the telephone business, and besides being profitable in itself, it is a most important aid in developing the local systems which it interconnects. The telephone business is changing and widening in a most marked manner; the public demands far greater and more comprehensive facilities from those who serve it telephonically than it did a

few years ago; and the telephone company of to-day will find its prosperity in extending those facilities on the most ample scale possible, in anticipating as far as possible the public demands, and in offering such a multiplicity of communications that traffic and business will be created by the mere fact of the facilities being available.

Now the toll-line, meaning as distinct from the long distance line proper, the line of moderate length connecting a city with its suburbs or with neighboring towns, or connecting important towns in the same or neighboring counties, tapping all the intermediate small places, is one of the most potent aids in this line of telephone development. The telephone has long outgrown its original function of local communication, confined entirely to a single town or city. This has been made widely evident by the spectacular feats of long distance lines a thousand and fifteen hundred miles in length; telephoning over these great distances has been an every day affair in this country for several years past. But extreme long distance telephony is by no means the most useful nor the most profitable branch of the toll-line business. It is undoubtedly a great aid in developing the business as a whole, and in impressing the business man and the public in general with a profound respect for the capabilities of the telephone. It is, however, an expensive and difficult business to conduct, requiring an enormous investment in a plant of a very perishable character, and involving very heavy operating expenses and maintenance charges.

On the other hand, the toll-line of moderate length, anywhere say from ten to fifty miles; is a money-maker of high capacity, and does not represent, in proportion to its earning powers, nearly so heavy an investment nor such high operating expense as the long distance line proper. The greatest demand for communication from any centre, concerns places comparatively near that centre, for the natural and simple reason that the interests, both commercial and social, of neighboring communities are closely interwoven, and to the average man it is much more useful to have quick and easy communication with places within a radius of fifty or even of twenty miles from his home or place of business, than it is to be able to talk over a radius of a thousand or fifteen hundred miles. Consequently the toll-line finds its business easily and finds plenty of it. Further, by offering to the public the facilities which it provides, it helps to develop the local systems at either end of the line.

So by all means let the building of toll-lines, the study of the best methods of constructing, maintaining and operating toll-lines and of toll-line traffic and rates, proceed apace. There is no other one branch of telephony which will better repay study, energy and enterprise. Our pages during the past few months have frequently presented evidence that the interest in the subject is widespread, and that there are plenty of Independent telephone men in the field who are fully alive to the importance of rapidly developing the toll-line business. There are two points which we wish to urge, in conclusion. They are not strictly original points, and in previous discussions have by no means been lost sight of by those best posted on the subject. One is the necessity of building good lines, and the other of giving the best service possible. A poorly-built line is dearer in the end and is of infinite annoyance in the way of poor talking, delays and breakdowns. A toll-line service to be profitable to its managers and to make friends of its customers, must be smartly operated and give good clear talking. The public is daily becoming better educated as to what constitutes a good telephone service and more exacting of efficiency. It will not long tolerate connections that take ten minutes to build up, or conversations where one of the parties is constantly occupied in saying "I can't hear you." A toll-line service, to pay and be popular, must be both quick and clear.

CONTEMPORARY CROSS TALK

IN these diffuse and discursive talks on telephone rates it has probably occurred to many readers, if many readers have followed them thus far, that the flat rate has been very hardly dealt with, bullied and teased to death, knocked on the head and put out of action and then often picked up again for another rap. Perfectly true, but there is some reason in this apparently inhuman and vindictive treatment. The vast majority of telephone men, or at any rate of owners and managers of telephone properties are still wedded to the flat rate. The flat rate for telephone systems of any size is wrong in principle and fatal in application and it is necessary to accomplish a divorce. In a divorce case it is the accepted method to introduce quantities of evidence against the character of the defendant, and this evidence must be all the more complete and crushing and the more fully expounded and sustained if the defendant has previously borne a good character made a strong showing in the world and acquired a large circle of friends and supporters.

* * *

We are going to have telephony with us for all time. The day is probably still far distant, and may it never arrive, when a man will be able to take a tuned or tunable ethereal receiver out of his pocket—or perhaps leave it in his pocket—and tap the ether for a talk with 4-11-44, Chicago, or 777,777 Pekin. Meanwhile, we have a great industry in telephony by wires and as far as human foresight can tell we are not now justified in planning to telephone by any other means except by wires. That being the case we have got to plan the organization and development of our business along its natural and correct lines as well as we can ascertain them, discarding everything that is feeble, erroneous and illogical. The flat rate is unnatural and incorrect; it is feeble, erroneous and illogical; it is deceptive and unjust to the subscriber and dangerous to the telephone manager. For those reasons it has been flayed so frequently and so mercilessly in these notes and its weaknesses and dangers so fully exposed and descanted on.

* * *

Not only are we going to have the telephone business with us for all time, but we are barely on the threshold of an enormous development of the telephone business, of which the signs have been multiplying during the last few years. The causes that have held back this development so long are several, but the chief among them is undoubtedly the flat rate. To be safely profitable a flat rate must be high and a high rate naturally attracts few customers. A low flat rate is dangerously unprofitable and even accompanied by the greatest skill in administration must eventually be swamped by the increased amount of service demanded by the average customer. Until lately, however, low flat rates have been rare, so as the majority of rates were high the flat rate has been an important factor in deferring to the present time the great development in the telephone business that is now setting in.

* * *

But the flat rate is not the sole cause of the comparatively slow development of the first twenty years of the telephone business. It has been necessary to educate the public and to create and develop the machinery with which to conduct the business. The great general public is a slow body to move. It will not take up and use in a day every new facility that inventors produce and discoverers reveal to it. The majority of men, and almost all women are conservative, and especially so in their personal habits. Telephoning is essentially a personal habit and very fortunately so for us telephone men. For as we know since our earliest days with the Latin grammar the force of habit is strong. While the acquisition of new habits is opposed by most men and women, when a habit is acquired not only is it difficult to part with but it is cumulative in its effect, it strikes root and grows and is apt to affect many other acts and habits. This is a most encouraging and stimulating reflection to-day when the telephone habit is spreading so widely and so rapidly, but in the early days of the telephone the natural conservatism of the general public the deficiencies and the cost of the service caused the telephone habit to filter very slowly through the small group of business men in each community that first took it up into a gently widening circle which rarely touched any but purely business territory.

* * *

Then no complicated organism of machinery such as the modern city telephone system could possibly spring into existence fully equipped and perfected, like Minerva from the brain of Jupiter.

The early telephone exchanges were very crude affairs and gave a very crude and imperfect service, judged by the standards of to-day. The telephone itself was perhaps the most complete and perfect invention that has ever been produced, with the possible exception of the Lucifer match. But to give the telephone its present-day usefulness and to realize its almost unlimited possibilities consider the innumerable appliances with which it has had to be surrounded. To begin with, without the battery transmitter the telephone would be about as useful for practical purposes as the phonograph is to-day, and the phonograph was invented almost at the same time as the telephone. Even with the battery transmitter the telephone would have but an insignificant field but for the switchboard, and until the multiple principle was invented the switchboard was as crude a device as the horse car compared to the electric train. And when you come to the multiple switchboard you open up a vista of a never-ending series, an ever-widening stream of inventions, devices and improvements that go to make up the telephone system of to-day, but which have taken time, trial, money, effort and experience to produce.

* * *

The telephone exchange is only a little over twenty-two years old, and while the early development of the business and art may seem slow to those enthusiasts who have quite recently become telephone men, still it has made more rapid progress than the majority of the applications of science that affect the people on a large scale. Neither the railway nor the telegraph was as much developed or perfected, or gave as general and efficient a service, within twenty-two years after the first locomotive puffed or the first key clicked. This is partly due to the more rapid pace at which industries are developed to-day than they were fifty years ago and partly to the fact that railway and the telegraph have done pioneer work for the telephone. The railway made possible a fast mail service and the telegraph gave a quicker means of communication than the steam-carried letter. When the telephone appeared with its offer of instantaneous communication, directly between the two parties to that communication, the offer was taken up more quickly than it otherwise would have been because business people were already accustomed to rapid communications and were glad to be provided with something more rapid. As supply naturally arises to meet demand the stimulus applied to the development and perfection of telephonic apparatus has been greater than that operating on the railroad and the telegraph in the early days of those industries.

* * *

The progress in the development of telephonic apparatus is now making prodigious strides. The whole industry has broadened enormously during the last few years, and as we have just said we are barely on the threshold of a development in the use of the telephone service that will one day make the telephone as familiar an object in every household as the appliances of light, heat and water supply are to-day. This being so, and no good telephone man will accept any less ambitious future for the telephone, it behooves us to encourage that development by all the means in his power and so to organize our business that we shall be able to cope with it effectively in all ways, and, above all, profitably.

The Listening-Key.

LAW-SUIT FOR A FRANCHISE.

THE Central Union Telephone Company has brought suit against the town of Wooster, Ohio, to compel the city to pass an ordinance giving the company a franchise to operate a telephone system. The Central Union Telephone Company claims that the city of Wooster, through its council, has refused to grant a franchise to the company permitting it to string its wires and put in an exchange in Wooster. On the other hand the city claims that it has never refused to grant the company a franchise, but has simply failed to pass an ordinance which would grant a franchise, and which ordinance was prepared by the Central Union Telephone Company and not by the council of the city of Wooster.

The city has filed an amended answer, calling the attention of the probate judge to the ordinance just recently passed by the city, compelling wires of all future companies to be put underground in conduits. The ordinance itself was cited in the amended answer.

IMPORTANCE OF THE WIRE PLANT

By W. L. HORN

THE most important part of a telephone system is the wire plant. It is the most expensive part to build and maintain, the most difficult to keep in order, the most liable to damage from all kinds of causes, and is the only part of the system vulnerable to the attacks of the elements of nature. The subscriber's station to-day is a comparatively simple and solid piece of apparatus and, on the common battery system, contains few moving parts or accessories that require inspection, repair and renewal. A well-made and well-mounted central energy subscriber's set might easily work for twenty years without being looked at by the inspector except for the purpose of cleaning the polished metal parts, whereas in the days of local batteries and hand generators several inspections a year were necessary to keep the station up to the mark. The modern switchboard, with all its complication of wiring and huge collection of delicate moving parts, gives very little trouble. Conscientiously made, wired and put together, properly watched and cared for by competent men, the central energy lamp signal switchboard of to-day works with far greater regularity and fewer internal troubles than the series multiple board which passed into history but a few short years ago.

But the wire plant is always the real weak spot of the telephone system; it has to be watched and tended and pampered and nurtured like a sick child. Wires corrode and break or make contact with others, poles decay, cross-arms get awry, cables suddenly go dead grounded, all the ills that metal and wood are heir to occur to the wires of a telephone system and to their supports, envelopes and protectors. Along comes a sudden storm and down go miles of poles and hundreds of miles of wire. A water main bursts or a sewer backs up into a manhole, and a few hundred wires are put out of business by grounded cables. Malicious damage by strikers, mischievous damage by idle boys, trolley-wire contacts, internal rust and corrosion, accidental damage done in the original construction or in subsequent repairs, all aid to swell the list of troubles from which telephone wires suffer.

Yet, as we have said, the wire plant is at once the most important and the most expensive part of the system. It is like the track to the railroad train. If it is not in good order, in serviceable condition and always at its best state of efficiency, the rest of the system might as well be in Mars for all the use it is. Your telephones and switchboards may work ever so well, but if your line is poor the good telephones and good switchboards are simply wasted. Notwithstanding these very obvious facts, many telephone men do not pay nearly the amount of attention to their wire plants that the importance of the subject demands. The tendency is too much to use cheap wire and poorly built lines, a tendency that it is the earnest desire of practical telephone men to reform. The articles printed in this paper advocating and describing the best methods of telephone line construction will repay careful study by all telephone men, for many reasons. The wire plant is the basis of the whole system and is the principal item of cost. When once built after a certain style it can only be rebuilt at the cost of infinite trouble and large expenditure, and if it is built in a cheap manner at the beginning that trouble and that expenditure will inevitably have to be undertaken. A relatively poor telephone will talk over a good line, but the best telephone ever made will not talk

well over a bad line. And the effects of bad lines are cumulative. A bad line joined to a good line will nullify the good qualities of the effective line. A bad line joined to another bad line will produce an impossible line. A very short bad line joined to a toll line that gives good, clear talking by itself will turn the good talking into a hopeless struggle to hear and be heard.

All this being so, and it incontrovertibly is so, it behooves telephone men to pay a little more serious attention to wire and wire building, laying and maintaining than they have been doing in the past. To begin with, iron wire should forever be banished from the telephone field, except for guys and stays and for those of course steel is better than iron. Iron wire is all very well for fences and fastenings, and even for short telegraph lines, but it should have no place at all on the lines of a telephone system. Its single recommendation is its cheapness, and that is merely an illusory recommendation, as cheapness in first cost is generally the forerunner of heavy expense for repairs and renewals. Iron wire rusts and corrodes rapidly when exposed to air that is much charged with acid fumes, soft coal smoke, dampness, salt, in short, when exposed to almost any air except that of a sandy desert. The best galvanized iron wire has been known to rust out in a year or two when strung overhead in cities. It is particularly liable to rust at joints and bindings, and so produce microphonic contacts that are by no means conducive to good telephone communication. The electrical properties of iron condemn it for telephone purposes as strongly as do its mechanical properties. It has, for similar sizes of wire, less than one-sixth the conductivity of copper, that is to say, a given length of iron wire will have over six times the resistance of an equal length of copper wire of the same size. For short distances the effect of a considerably higher resistance on the telephonic current is not appreciable, as the rapid alternations and relatively high voltage and small volume of the telephone current, together with the great sensitiveness of the telephone receiver tend to make the actual ohmic resistance of telephone wires a secondary consideration. Where steady currents of any volume are concerned, however, resistance is a very important factor, and the use of iron conductors becomes very disadvantageous. A property which iron possesses to a much greater degree than copper, rendering it a very poor conductor for telephonic currents, is that of electro-magnetic inertia. This is a sort of magnetizing and demagnetizing of the conductor by the current, the phenomenon being much more marked in magnetic conductors, such as iron or steel, than in non-magnetic conductors, such as copper. In fact, copper, as compared with iron, possesses practically no electro-magnetic inertia, whereas iron possesses it to a marked degree. The effect of electro-magnetic inertia in the presence of the rapid reversals and variations in strength of the telephone current is to cause retardation, distortion of the waves of current which represent the sound waves, and so to cause confusion and muffling of speech, for upon the faithful transmission of all the waves in their true form depends the reception of clear speech at the distant end of the line. While the resistance of a short iron wire may be a matter of no moment, its retardation may be quite considerable, and may have a marked effect on the telephonic transmission. Thus we see that iron is naturally unsuitable for use in telephone lines.

THE CORN CORNER AND THE TELEPHONE

FARMER'S telephone lines are universally given credit more than anything else, for bringing the recent corner in corn to an abrupt ending. In these days of rapid transportation and instantaneous communication, it is possible for farmers living in outlying districts, to keep in touch with all happenings in the large cities of the world. In the North, the East, the South, the great Middle West, and on the Pacific slope, telephone lines radiate from small cities and towns, reaching all farms, villages and hamlets. From the large cities and business and industrial centers, in turn, the lines run to the smaller exchange centers. Every farmer or inhabitant of the rural sections, who is progressive and up-to-date enough to want it, can now have a telephone in his home. The farmers, too, are realizing the enormous benefits and advantages of such a service. From all over the country comes the news that they are clamoring for telephones. If the nearest company wont furnish them

service, they band together and construct a system for themselves, and inevitably force the company to recognize them and give them exchange service with the outside world.

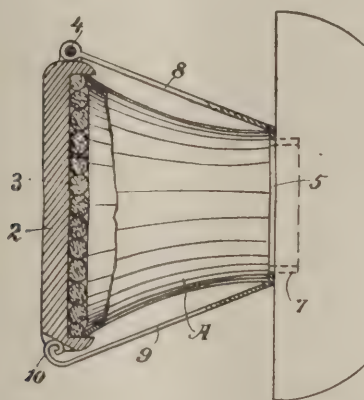
It was this modern condition that brought the Chicago corn corner to an end before it had scarcely been begun. Every man holding any corn of the contract grade was reached as quick as a flash by the magic telephone. The corner was prevented, and prices kept from soaring.

Only a very few years ago this would not have been possible. The men who had produce to sell, depended entirely for their information on the small country weekly newspaper. Even to get this, they must necessarily ride or drive many miles in some instances to the nearest post office. The advent of free rural delivery bettered conditions somewhat. But it was not until two or three years ago, when the telephone came into such general use under the Independent regime, that the terrible insolation of farm life has been made bearable.

Patents

Henry C. Smith and Mark H. Woolsey, of San Francisco, patent (No. 708,671, September 9, 1902) an antiseptic attachment for telephone mouthpieces, intended to keep the mouthpiece of a telephone in a cleanly, antiseptic condition. The attachment serves to minimize the danger from the promiscuous use of telephones, to destroy any disease germs which may be lodged within the mouthpiece from such uses and to protect the mouthpiece and connected parts from the ingress of dust or foreign matter.

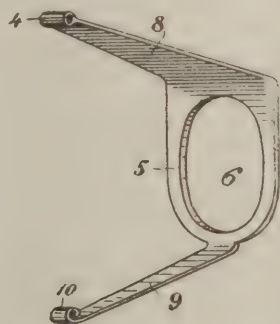
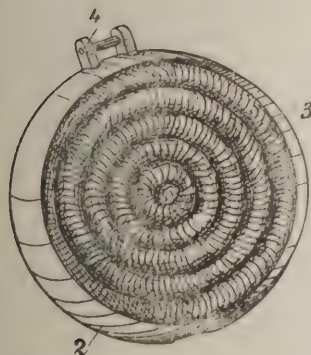
Fig. 1.



It consists of the cap 2 adapted to close over the mouth of the part A. This cap carries within it any suitable absorbent material 3, which is properly saturated with a sterilizing or antiseptic substance, so that when the cap is closed over the mouthpiece this material forms contact around the periphery, and thus cleanses and sterilizes the mouthpiece, besides forming a closure to prevent the access of dust. It also serves by closing to prevent the rapid evaporation and loss of sterilizing substance and to maintain the vapor or fumes, if any such arise, within the instrument where such vapor or fumes will be of the most service.

Fig. 2.

Fig. 3.



The device is hinged at 4 to the bracket shown in Fig. 3, which is clamped to the face of the transmitter case by the mouthpiece. The cap, being hinged to the bracket at 4, is closed over the mouthpiece by the bevelled edge 2 engaging with the turned over end 10 of the lower plate 9 of the bracket. Thus the cap is held normally closed over the mouthpiece, and may easily be released by a light pressure when it is desired to open the device for use. In this manner the interior of the apparatus is cleansed and sterilized after each use, and the vapor of the sterilizing substance which is contained in the fibrous material 3 will serve to purify the whole interior of the device.

WILL COVER PENNSYLVANIA

INDEPENDENT telephone construction in the State of Pennsylvania is on a decided boom. Everyone in the field there, seems to have more work than can possibly be accomplished. New toll lines, long distance lines, local lines, connections between exchanges—all these are being planned and executed with a rapidity that soon promises to give the Keystone State one continuous web of telephone lines, and Independent connections with every city, town, village, hamlet and farm house in the state and border states.

The Johnstown Telephone Company, operating in the town which was afflicted some years ago by the disastrous accident remembered as the Johnstown flood, has been increasing its local facilities for many months past. These improvements are now nearly completed, and it is reaching out for outside business. It will soon commence the construction of many additional lines in Somerset County. The use of the company's Somerset lines has become so general and the patronage has grown to such a point that additional equipment is necessary. Under the present arrangements, connections are made at Somerset with the Somerset Telephone Company's lines, extending the value of the local service. The Johnstown Company's patrons will also benefit by the stringing of lines from Meyersdale, Pa., to Cumberland, Md. At the present time the Johnstown Company's service through the Somerset County Telephone Company's lines, ends at the State line.

The Johnstown Telephone Company in conjunction with the Cambria County Telephone Company, has already put through extensions which will afford its patrons cheaper and more efficient telephone service into Hastings, Spangler, Barnesboro, Carrolltown, and the other thriving towns in the north of Cambria County. It has also recently completed a copper metallic trunk line to Ebensburg, through Cresson. The Cambria County Telephone Company has built new toll lines connecting the towns above named. Connection between the two systems has been made at Cresson, which is now the most central exchange town in the county. The two companies make a free interchange of business not on their toll lines.

The Cambria County Telephone Company was formed by the combination of the Cresson Telephone, the Northern Cambria county, and the Clearfield & Huntingdon Telephone companies. Work is now being pushed on a line connecting McGee's, Glen Campbell, and Mahaffey with the main circuit. The Johnstown Company has a through line as far west as Kittanning, Armstrong County, via Indiana, while its eastern service extends to Pottsville, Pa., through Altoona.

It has been suggested that by combining with the Cambria County Telephone and the Somerset County Telephone Companies, the Johnstown Telephone Company could become one of the most important Independent systems in the State.

INDEPENDENT SYSTEM IN MOBILE

MOBILE, Ala., now has a first-class Independent telephone system, one which is equal to any in a city of the same size, and will compare favorably with most larger cities. When the system was first established in Mobile, the promoters, not having had any practical experience in the telephonic art, did not see the necessity for the best construction. They built the plant very cheaply, and thought more profit would thus be secured, and at the same time a satisfactory service be given.

It is a well-known fact in Independent telephony now, however, that cheap construction costs the most in the end. And as a result, the entire system of the Home Telephone Company of Mobile has been rebuilt, and this time in the most substantial manner. Even if the first construction had been of the best, much reconstruction would have been necessary, on account of the increased demand for service.

The company has during the past year put in new telephone instruments for every subscriber, strung new copper metallic circuits, put many wires under ground, made many switchboard additions and improvements.

The officers of the Home Company are James K. Glennon, president; A. S. Lyons, vice-president; Adam Glass, treasurer, and W. H. Bryant, manager.



New Companies

DENVER, COLO.—The People's Telephone Company has been incorporated with a capital stock of \$200,000. It will operate in El Paso, Arapahoe, Boulder, Clear Creek, Gilpin, Jefferson, Pueblo, Fremont and Custer; Richard J. Bolles, John T. Sanger and Samuel Hart Benton are the incorporators.

SELBYVILLE, DEL.—The Selbyville Telephone Company, Selbyville, has been incorporated with a capital stock of \$50,000. Incorporators: John G. Townsend, Jr., Isaiah W. Long and Isaiah J. Brozure, all of Selbyville.

MODE, ILL.—The Holland Township Telephone Company, of Mode, has been incorporated with a capital stock of \$1,500 to operate a telephone system; incorporators: W. B. Lantz, J. E. Gallagher and S. A. Ragan.

MILFORD, IND.—The Royal Telephone Company, of Milford, has been incorporated. Its capital stock is \$20,000, and the directors are J. W. Whitehead, James Hollar, George G. Grady, Joseph Arnold, William Neff, P. J. Miles and M. P. Wright.

BURT, IA.—Articles have been forwarded to the secretary of state for the incorporation of the Burt Telephone Company, whose principal place of business is to be at Burt. The authorized capital is \$15,000, and the organizers and directors of the company are: Al Staehle, W. C. Dewel, O. P. McDonald, H. O. Buell, W. T. Peters, Lincoln Hall and C. D. Smith. The object of the company is to put in a local exchange at Burt, and to run seven or eight rural lines from Burt into surrounding country. Twenty-five miles of poles and wire, and 100 telephones have already been purchased.

PRINCETON, KY.—T. J. Johnson is endeavoring to interest capitalists here in a telephone company, of which he is the promoter. The company if organized will compete with the Bell here.

VANCEBURG, KY.—The Maysville and Vanceburg Telephone Company, of Lewis County, has been incorporated with \$2,500 capital stock. A. J. Stein, of Vanceburg, and J. W. Chambers, of Winchester, are stockholders.

MANKATO, MINN.—The Minnesota Valley Telephone and Telegraph Company has been organized here. Articles of incorporation have been filed. The following have been elected directors: Dr. J. H. James, H. A. Patterson, Dr. I. D. Webster, F. M. Currier, W. N. Plymat and W. D. Willard, all of Mankato; E. H. Moulton, of Minneapolis, and J. B. Meagher, of St. Paul. The officers will be as follows: President, Dr. J. H. James; vice-president, H. A. Patterson; secretary, W. D. Willard; treasurer, E. H. Moulton. The president, vice-president and secretary hold the same offices in the Citizens' Telephone Company. The treasurer is president of the Twin City Telephone Company. The work of constructing the toll lines is to be started as soon as possible. The new company is organized primarily for the purpose of building toll lines to connect Mankato with the Twin Cities. The Citizens' company is to be connected directly with the Twin City Telephone Company of St. Paul and Minneapolis. The new company is capitalized at \$100,000. There are twenty-five stockholders, all but two of whom are of Mankato. These two are E. H. Moulton, of Minneapolis, president of the Twin City Telephone Company, and J. B. Meagher, of St. Paul.

MANKATO, MINN.—There is a current rumor to the effect that a third new telephone company has been or is about to be organized at Mankato, to be known as the Canada Valley Telephone Company. Dr. J. H. James and John B. Meagher are said to be large stockholders. It is also said that thirty to forty other prominent men of the city have purchased shares.

SMITHVILLE, MO.—The Fayette and Bastrop County Independent Telephone Company, with principal office at Smithville, has been incorporated with a capital stock of \$2,000. Incorporators: R. H. Redfield, J. A. Bell and J. H. Roensch.

WAKEFIELD, N. H.—The Wakefield Telephone Company has been incorporated with a capital stock of \$1,000. J. W. Garvin, president; Arthur L. Foote, secretary; J. W. Garvin, Richard W. Dow, Pearl W. Haskell, directors.

HIGHMORE, S. D.—The Hyde County Telephone Company, Highmore, has been incorporated with a capital stock of \$1,000.

MORGANTOWN, W. VA.—The West Morgantown Improvement Company, of Morgantown, has been incorporated, for the purpose of building and repairing houses, laying out lands and lots, building roads and bridges, constructing and operating telegraph and telephone lines. Capital stock \$200,000. Incorporators: Milton Herschman, E. M. Grant, D. H. Courtney, W. E. Glascock and I. C. White, of Morgantown, W. Va.

Legal

SAN FRANCISCO, CAL.—The answer of the Pacific Telephone and Telegraph Company to the suit to collect a tax of \$2 on each nickel-in-the-slot telephone, brought by the city, has been filed. The telephone company denies that the city has a right to bring suit to recover taxes under any provision of the charter, and claims that the bringing of the action is a violation of the constitution and as such is unlawful discrimination against the company.

ST. JOSEPH, MO.—The Missouri and Kansas Telephone Company has filed suit in the Circuit Court praying judgment against the St. Joseph Railway, Heat Light and Power Company in the sum of \$2,000, and for cause of action states that prior to the eighth day of June, 1900, the plaintiff company had permitted defendant to place wires upon its poles, it being agreed and understood that the wires so placed should be properly insulated and rendered safe. On the ninth day of June, 1900, plaintiff alleges that Frank Drake, an employee of the company, fell from a pole, and was instantly killed. An action was begun and prosecuted to a conclusion against the telephone company by Carrie Drake, widow of deceased, resulting in a verdict of \$5,000. A settlement was effected for \$1,500, which amount together with \$500 costs of suit, the telephone company now seeks to recover from the defendant, averring that the accident which caused Drake's death resulted from the negligent placing and insufficient insulation of the wires of the light and power company.

RALEIGH, N. C.—Suit has been brought by the Raleigh Telephone Company against the Southern Bell Telephone Company, to recover damages for the loss of some poles that belonged to the Raleigh Telephone Company, but that were shipped by mistake to the Southern Bell Company. The matter will doubtless be left to a referee.

Financial

SANDWICH, ILL.—A trust deed and mortgage conveying the property, franchises and all rights of the Northern Illinois Telephone Company, and given by the company to J. B. Castle and S. P. Sedgwick, trustees, of Sandwich, Ill., has been filed. The mortgage is for \$75,000, and of this amount \$56,000 is to take up outstanding indebtedness, and a part of the balance it is claimed, will go towards completing the plant at Ottawa, Ill. The mortgage covers the company's property in DeKalb and Kendall counties and the following townships of La Salle county: Northville, Adams, Earl, Meriden, Mendota, Troy Grove, Ophir, Freedom, Serena and Mission. There are 450 bonds in all. The mortgage is executed on the part of the company by F. T. Mosher, president, and E. C. Hinnis, secretary.

LYNN, IND.—The Lynn Local Telephone Company has increased its capital stock from \$2,400 to \$8,000.

SIOUX CITY, IA.—Large increases are made in the assessments of the telephone, telegraph and express companies in Woodbury County, according to the report of the assessments. The report shows there are 28.50 miles more of telephone wires than one year ago. The total assessment of the telephone companies in the county has been increased \$2,035.

BOSTON, MASS.—Directors of the Chicago Telephone Company have announced a quarterly 2½ per cent dividend, payable October 1 to stockholders on record September 1.

BOSTON, MASS.—The Boston Stock Exchange has stricken from the list, Michigan Telephone Company consolidated mortgage ss. 1929. Certificates of deposit for the Michigan Telephone Company consolidated mortgage 5 per cent. 30-year gold bonds issued by Old Colony Trust Company, transfer agent have been admitted for quotation on the unlisted sheet. Michigan Telephone Company consolidated mortgage ss. 1929 can be traded in when specified.

YORKTOWN, N. Y.—The Yorktown Telephone Company held its first annual meeting recently. The company is in a prosperous condition and paid the stockholders 6 per cent. dividend.

THE WEEK'S MESSAGES *Continued*

Rates

HOOPER, NEB.—The Hooper Telephone Company and the Farmers' Telephone Company have made an agreement for the exchange of services over their lines. This includes lines to all towns in the country, excepting Fremont, and connections will be made there as soon as the Independent system is completed. The Nebraska Telephone Company has taken notice of this arrangement by issuing a new schedule of prices, which practically cuts in two the former rates to towns in this neighborhood. The new rate to Fremont, Scribner, Snyder and Ames is 15 cents, while the rate to North Bend, West Point, Dodge, Tekamah and Oakland is placed at 20 cents.

Elections

BILLINGS, MONT.—The directors of the Billings and Musselshell Telephone Company are apparently well pleased with the management of L. L. Moffett, who has had charge of their lines for several years. At a meeting of stockholders the line was leased to Mr. Moffett for one year. The officers were re-elected as follows: President, J. W. Newton; secretary and treasurer, Fred W. Handel; directors, J. W. Newton, F. W. Handel, C. Y. Egen, S. H. Erwin and O. E. Mills.

JERSEY CITY, N. J.—At the annual meeting of stockholders of the Inter-State Telephone and Telegraph Company, the following new directors were elected: Edward Dickinson, of the First National Bank, of Chicago; H. D. Wagner, of H. D. Wagner & Co., bankers, of Hinckley, Ill., and Charles B. Cheadle, a lawyer of Joliet, Ill.

NEW PHILADELPHIA, O.—At the annual meeting of the directors of the Tuscarawas County Telephone Company held here, the following officers were chosen: E. A. Walters, secretary; J. L. Kennedy, treasurer, and O. C. Obetz, general manager. Messrs. B. P. Scott, of this city, and C. H. Slingsluff, of Canal Dover, were re-elected president and vice-president.

Franchises

COLORADO SPRINGS, COLO.—A profit sharing telephone franchise has been presented to the city council by J. J. Burns and S. J. Bear, of Pueblo, who are said to have large financial backing. The promoters claim that they can give the city a better service than at present and can reduce the business house rate 40 per cent. and private residence 100 per cent. They guarantee to begin work within 120 days of the granting of the franchise and to put the system in operation within one year from the time of starting work. The promoters further promise to furnish 15 telephones free of expense to the city and also to give 1 per cent. of the earnings of the company, the city at all times to have free access to the books of the company. The business house rate will be \$50 and residences \$36. The Citizens' Telephone Company, of El Paso County, is also an applicant for a franchise from the city. This company agrees to give a business house rate of \$48 and a residence rate of \$24. The company filed its articles of incorporation with the Secretary of State recently. Among the local people interested are H. P. Lillibridge, R. J. Bolles, John F. Sanger, Van E. Rouse and Judge Ira Harris.

FLORENCE, COLO.—The People's Telephone Company, recently organized, is desirous of maintaining a telephone exchange here, and has petitioned the City Council for a franchise. At present the Colorado Telephone Company has no competition, and it is generally understood the council favors a new company entering the field.

NEW SMYRNA, FLA.—At the next meeting of the town council J. P. Turner & Company will ask for a franchise granting the right to erect wires and operate a telephone system in New Smyrna. The contract for the poles will be let as soon as the franchise is granted. The rate will be \$3.00 per month for business houses and \$1.50 for residences.

RUSHVILLE, ILL.—The Rushville and Ray Mutual Telephone Company has been granted a franchise to construct and operate a system here.

BUNKER HILL, IND.—A fifty-year franchise has been granted John H. Wiles and E. F. Wiles to construct and operate a telephone system in this town. Work is to begin by Dec. 1, 1902, and the plant to be completed by Dec. 1, 1903.

STORM LAKE, IA.—The special franchise election here resulted in a large majority in favor of a franchise for the Northern Telephone Company.

BOWLING GREEN, KY.—The city has sold at public outcry a franchise for a new telephone system. It was purchased by Nerge Clark as attorney for J. E. Mott, who is the representative of a syndicate which owns a number of telephone systems in several States. The franchise brought \$100 with certain concessions granted the city. The company proposes to establish a system with underground wires. The two companies already here use overhead wires in the city and county. Both have been ordered to place the wires underground and remove the poles from the streets.

WESTBROOK, ME.—An ordinance has been reported granting permission to the Westbrook Telegraph and Telephone Company to erect and maintain poles and wires for a period of twenty years, the company to furnish

free, four telephones for municipal purposes and to commence work within six months from date. The report of the committee was accepted and the order was given a first reading.

FALL RIVER, MASS.—A petition has been received from the Southern Massachusetts Telephone Company for permission to lay and maintain underground conduits and manholes with wires and cables here. The petition also asked for permission to erect and to maintain distributing poles and wires and underground conduits, cables, etc., for connections.

KANSAS CITY, MO.—An ordinance has been introduced here imposing a tax of \$1 a year on each telephone pole in the city and \$2.50 for each mile of wire. The ordinance provides that telephone rates shall be fixed at from \$36 to \$54 a year, with additional charges for distances of more than two and one-half miles, and also provides for increasing the underground conduit district.

BILLINGS, MONT.—The City Council has adopted the report of a majority of the street and sidewalk committee giving the Moffett Telephone Company right to erect its poles in the corporate limits. The company will begin the construction of its new telephone line at once, as all questions are now settled.

HELENA, MONT.—Application for a franchise has been received here from a Chicago telephone company, offering service at \$3 a month.

OMAHA, NEB.—The fight for a telephone franchise here is about to be revived and, according to inside information, the chances are good for the new company getting what it asks for. Some quiet work has been done recently and the new company, headed by Joseph Murphy and George Parks, is said to be in a position to push an ordinance through the Council.

GLEN GARDNER, N. J.—The Lebanon Township Committee has granted a franchise to the Merchants and Farmers' Telephone and Telegraph Company of Hunterdon County to erect poles along the streets and highways of said township. The company is composed of well-known Hunterdon County men, and will run its line from Clinton to Glen Gardner. From that place lines will be run to Spruce Run, Woodglan and Anthony, to High Bridge, Bunnvale and Calton, to Junction, New Hampton and Changewater. The company will charge \$1 per month to private families and \$1.50 a month for business places. Other townships will be asked to grant a franchise.

LE ROY, N. Y.—The Bell Telephone Company has been granted a franchise here. The telephone company has been doing business in this village for several years, but has never had the kind of a franchise it desired. The wires of the company on the main street must be put underground before January 1, next.

LIMA, N. Y.—A franchise has been granted to the Inter-Ocean Telegraph and Telephone Company to construct a telephone system in Lima. The line may be extended to other parts of Livingston County.

FORT WORTH, TEXAS.—The Cleburne Independent Telephone Company, of Cleburne, recently organized, has been granted a franchise to construct and operate a telephone system here. W. F. Ramsey and J. H. Keith, of Cleburne, and F. B. McElroy, of Fort Worth, are the organizers of this company.

OGDEN, UTAH.—The City Council has refused to extend the franchise of the Rocky Mountain Bell Telephone Company from 7 years to 30 years.

OSHKOSH, WIS.—A. B. Ferdinand has asked for a franchise to construct and operate a telephone system here.

Combinations

WALKERTON, IND.—The Walkerton branch of the Starke & St. Joseph telephone line has been sold by J. G. Steinman, of Knox, to Charles Lemert, of Teegarden. The line now intersects the South Bend Home telephone line at Teegarden, the two lines thus giving direct communication between Walkerton and South Bend. Arrangements are being made to run the Home line to North Liberty at an early date. Some improvements will be made in the local exchange.

DETROIT, MICH.—Mayor Maybury is going to take an active interest in the effort to have the People's Telephone Company's plant completed and to combine with it the Co-Operative Company's exchange so as not to have three plants in the city. Cleveland people have proposed that a company be organized in Detroit to complete the plant, and that \$300,000 of the stock be taken by Cleveland capitalists, who will also help to raise another \$100,000.

NEWTON, N. J.—The New York and New Jersey Telephone Company recently purchased the Hudson River Telephone Company throughout Sussex County. Many improvements will be made, commencing at this place.

ATTICA, N. Y.—Arrangements are under way for the transfer of the Attica, Bennington and Cowlesville Telephone Company's property and rights to the Inter-Ocean Telegraph and Telephone Company. The latter company proposes to place a local exchange in this village and make outside connection through the Frontier Telephone Company of Buffalo, the Home Telephone Company of Rochester, and with all other cities and towns having companies other than the Bell Telephone Company. They will offer both local and out of town rates at prices under the Bell Company.

THE WEEK'S MESSAGES *Continued*

BUFFALO, N. Y.—It is reported that a combination has been effected between the Frontier Telephone Company and the Alden telephone system.

PHILADELPHIA, PA.—It has been reported that the United Telegraph and Telephone Company, the lessee of the Cumberland Valley Telephone Company and the Dauphin County Telephone Company, both of which control a wide extent of territory, have merged with the Keystone State Telephone Company, of Chester and Delaware County, which is controlled by the Keystone Company, of this city. This combination of interests would mark the entrance of the Keystone Telephone Company into the field of long distance competition with the Bell Company. The Keystone Company has been anxious for some time to extend its service beyond the limits of Philadelphia. It has been blocked at every point by the rival concern, which held a practical monopoly on the long distance business. The merger effected between the Keystone State Company and the United Telegraph and Telephone Company opens a way for the Keystone Company to extend its service through a populous section of the State, and possibly as far as Pittsburg. Other advices from Philadelphia state that the officers of the Keystone Telephone Company deny this merger.

LEESBURG, VA.—J. J. Hurst, representing the Baltimore Telephone and Telegraph Company, is in Loudoun looking to a consolidation of all the Telephone lines of Loudoun extending into Leesburg, with the exception of the Old Dominion Line, familiarly known as the Waterford line. It is reported that he has bought Aldie line for \$700, and has an option on the Snickersville Company's several lines at \$3,000.

KENOSHA, WIS.—The Bristol Telephone Company plans to combine all the rural lines in this county. It has purchased the Paris, Union Grove and Bristol Company and will purchase a line running from Kenosha into Northern Illinois, when the Bristol Company will practically have control of all the rural lines in the county. The only line being left out of the combine runs between this city and Pleasant Prairie, which is under the control of the Wisconsin Telephone Company.

Competition

ALEXANDRIA, IND.—The Delaware and Madison Telephone Company, which was granted a franchise in this city last winter, has its plant well under way and a force of men at work wiring the residences of subscribers. This is the first rival the Central Union has ever had in this city. The new company has plants in successful operation at Elwood, Muncie, Anderson and other points. Rates have been lowered.

Underground

PUEBLO, COLO.—The telephone wires here will soon be put in underground conduits at an expenditure of about \$125,000.

NAUGATUCK, CT.—It is probable that all telephone, telegraph and electric wires here will be ordered underground soon.

WILMINGTON, DEL.—The Delaware and Atlantic Telephone and Telegraph Company is working on several miles of new underground conduits, and as soon as these are completed work upon additional ones will be commenced and the work will continue until all of the wires in the city are underground. To complete the conduits now planned will take two years.

NEW BEDFORD, MASS.—The Southern Massachusetts Telephone Company has requested permission to lay additional conduits here in the bridge approach.

GRAND RAPIDS, MICH.—The Citizens' Telephone Company has asked permission to lay additional conduits here.

ST. PAUL, MINN.—An ordinance is being prepared, and in all probability will be passed requiring all telephone, telegraph and electric wires to be placed in underground conduits.

BROOKLYN, N. Y.—Negotiations are in progress between Water Commissioner Munroe and Engineer Seaver, and the telephone, telegraph and electric companies, for the burying of all wires here. It is quite probable that all new wires will hereafter be put in conduits, and that gradually all wires will be treated likewise.

BUFFALO, N. Y.—The Frontier Telephone Company has asked to lay additional conduits here.

CHARLOTTE, N. C.—The Southern Bell Telephone Company has been given permission to put its wires here underground, and will do so in the near future.

HAMILTON, O.—The Hamilton Home Telephone Company has been given permission to put its wires in underground conduits.

CHESTER, PA.—The local legislators have inserted a clause in the ordinance granting permission to the Delaware and Atlantic Telephone Company to place its wires in underground conduits, requiring the company to pay a certain sum every ten years for the use of the streets. The company objected to this proposition, and desires to pay a lump sum with the stipulation that the use of the streets be theirs for all time without any further payments. The matter will come up for final consideration at the next meeting of Council.

LANSDOWNE, PA.—The Highway Committee of Lansdowne Council

has approved the Keystone Telephone Company's plans for the construction of underground conduits along certain streets in the borough. General Agent F. A. Wunder, of Philadelphia, and Councilman Harry Hibbitt, of Glenolden, represented the company's interests here.

PHILADELPHIA, PA.—The Keystone Telephone Company has been granted a permit to lay a number of additional underground conduits for its wires.

PHILADELPHIA, PA.—The Bell Telephone Company has been granted a permit to lay a number of additional conduits here.

GALVESTON, TEX.—E. K. Baker, superintendent of the southern division of Texas for the Southwestern Telephone and Telegraph Company, with headquarters in Austin, is here for the purpose of making a general inspection of the work now being done in Galveston by his company. In this connection Mr. Baker said unless some unforeseen and unexpected contingency arises the work of taking down the telephone poles in the business section of the city will begin on or about Sept. 15 and the poles will be removed thereafter just as fast as the underground system can be installed. There are about 20 men now at work upon the underground wiring.

SALT LAKE CITY, UTAH.—The Rocky Mountain Bell Telephone Company will put its wires here in underground conduits.

Construction

HOT SPRINGS, ARK.—Numerous improvements are planned for the local telephone exchange. A new switchboard is being installed and will be in working order by October 1. It has a capacity of 1,200 lines and has all the latest improvements. It is also intended to put in new aerial cables which will do away with the network of wires on streets where there are no cables.

LOS ANGELES, CAL.—The Home Telephone Company expects to open for business here in about four months. Conduits are now nearly all laid. The Home people have several hundred men in their employ, and are prosecuting construction work as rapidly as possible. A quick start was made on the central building, and it is rising out of the ground as fast as the material can be placed.

WILMINGTON, DEL.—The Delmarvia Telephone Company, of Wilmington, is hurrying work on its new line to connect with the Keystone Company's lines in Philadelphia.

CARROLLTON, GA.—Manager L. K. Smith, of the Waynesboro Long Distance Telephone Company of this city, is superintending the construction work of the Buchanan-Cedartown extension of its lines. The extension is 18 miles and will have a half-dozen village pay stations on it. This increases the length of wire strung from the headquarters of this company here in the past two years to about 300 miles. Of this most of the lines are in Carroll and border counties. There have been established along these lines some seventy-five stations, making a most thorough service in this territory.

ALTON, ILL.—The Calhoun Telephone Company has received a large consignment of telephone poles to be used in work of construction of the telephone system to be built from Grafton to the boundary line between Pike and Calhoun counties near Brussels. The line will be started at once and work will be pushed as fast as possible. President Merida, of the Calhoun Telephone Company, is making preparations for beginning work. The line will be connected at Grafton with the Alton exchange and from here with the long distance telephone system. Another line will be built through Pike County to extend northward. The new telephone line will be connected at every town in Calhoun County and will afford telephone service to places where none has been given before.

BEELEVILLE, ILL.—The Kinloch Telephone Company is erecting a new telephone line through the valley.

PEKIN, ILL.—It will not be many more months until the Citizens' Telephone Company will cover a wide territory. It already connects with nearly every town in this section of Illinois. The company is owned entirely by local people, and is making rapid advancement. It has in the neighborhood of 700 subscribers in Pekin alone. Material is on the ground for an exchange in East Peoria and a force of men are daily engaged in its extension. Eventually service will be run into Peoria, Delavan, San Jose and other prosperous towns hereabouts are being looked after and the Independent company is installing systems. James W. Barrett, of Pekin, owns most of the stock in the telephone and electric light plants at Havana. The lease held by the Bell people will expire on these soon and the local company will then bring the business there up to a high point of efficiency.

NEW ALBANY, IND.—The Home Telephone Company, of this city, has received a carload of supplies for the improvements in the service which is to be made as soon as possible, and three more carloads will arrive soon. The company will put in a new switchboard similar to the one in use in Louisville, Ky. It will have a capacity of 3,000 telephones. Connections with the system of the Louisville Home Telephone Company will be made as soon as possible. Two metallic lines to Indianapolis have been connected.

RICHMOND, IND.—Arrangements are being made by which the Rich-

THE WEEK'S MESSAGES *Continued*

mond Home Telephone Company, and the Greenville Home Telephone Company will unite in putting in a copper long distance line and instruments, between Richmond and Greenville. This will be a very important line for Richmond since it reaches Sidney, Urbana, Springfield, in fact, all of Eastern and Central Ohio and assures cheap rates and prompt service. Work on the line will be started in a very short time and be rapidly pushed to completion.

WABASH, IND.—The Home Telephone Company has just received two new switchboards, which are being placed in position in the central office of the company. Already almost 100 patrons are connected to the new switchboards. The Wabash company has grown rapidly and Manager Kendall expects other additions to be made.

ELDRIDGE, IA.—A new telephone line is being erected from here to Long Grove. Sam Clapp, of Toledo, Ia., is superintending the job.

GILMORE CITY, IA.—The Northern Telephone Company, of Fonda, is constructing a line from Ft. Dodge to Humboldt, Gilmore City and Poca-hontas Center.

SCHALLER, IA.—The Schaller Telephone Company is soon to begin the extension of its lines into the country in two or three directions.

LOUISVILLE, KY.—The Home Telephone Company has been granted a permit for the construction of a two-story brick building to cost \$2,000.

MAYFIELD, KY.—J. A. Salmon, of Nashville, has taken charge, as manager, of the telephone system at Mayfield, which has been sold to the Cumberland Telephone Company. Mr. Salmon is putting in new cables and otherwise improving the service. One hundred new poles have been received and they are being put up as rapidly as possible.

LEWISTON, ME.—The New England Telephone and Telegraph Company is laying underground cables here. The conduit in which these cables are placed was put in two or three years ago.

NORTH VASSALBORO, ME.—The New England Telephone and Telegraph Company will soon begin work on a line from North Vassalboro to China.

STANDISH, ME.—The Standish Telephone Company will soon have a line to South Standish in operation.

BALTIMORE, MD.—The Maryland Telephone Company is completing many extensions. The most important is a long-distance line to Wilmington, Del., and Philadelphia. The line between Baltimore and Philadelphia will be opened in about two weeks. In ten days still another important long-distance connection will be opened. This is the line to York, Penn. It will connect with the Baltimore company 10,000 telephones in the southern part of Pennsylvania, western part of Maryland, and in several towns in Virginia and West Virginia.

SNOW HILL, MD.—The district manager of the Diamond State Telephone Company was here making arrangements for putting up new poles and lines and the general perfecting of the telephone system. The work in Snow Hill will commence at once and will be completed in about four weeks.

SPRINGFIELD, MASS.—It is accepted as a foregone conclusion here that 10 new telephone lines will be put in operation between Holyoke and Springfield, and the service between the two places bettered accordingly. The improvement is known to be under consideration by the New England Telephone and Telegraph Company.

BIG RAPIDS, MICH.—A telephone line is being constructed from Big Rapids to Edmore.

MARSHALL, MICH.—The switchboard for the Marshall Telephone Company has been received. The wires are already up and about 100 telephones have been installed, 300 having been subscribed for. The State line service is one of the best and will reach nearly all parts of the State, giving better service than the Michigan Telephone Company. Work is being pushed as rapidly as possible and the company will be in operation in about two weeks.

MESABA, MINN.—The Mesaba Telephone Company is making a number of improvements in its range system and when these are complete Virginia will be the central of all centrals on the Mesaba. The most important of the improvements is the placing of a toll-line to all range towns from Virginia, and also a long-distance circuit.

DIXON, MO.—The citizens of Crocker and Dixon are erecting a telephone line between the two places and have the line completed from Crocker to Hancock and are now putting it up between Hancock and Dixon.

BILLINGS, MONT.—Three carloads of material have been received by L. L. Moffett for his new telephone exchange and work will begin at once. A site for the central office has been fixed upon.

CHESTER, NEB.—The work of the Chester Telephone Company is progressing finely and the work of erecting the poles and placing the telephones will be commenced soon. A line has been surveyed over town, the central station located, a line run south and one west to Byron.

FREMONT, NEB.—The Independent Telephone Company has formally notified the City Council that it would accept the provisions of the ordinance giving it a franchise to operate a telephone system in the city. Work will begin in a few days. Connections will be made with the Farmers' Telephone Company's line.

FREMONT, NEB.—T. J. Reddy, who has just completed the erection of a telephone system at Carrollton, Mo., arrived in the city and will act as superintendent of construction for the Fremont Telephone Company. An order for instruments, poles, wires and other material will at once be placed, and it is expected to push the construction work with rapidity. The promoters of the enterprise are also looking up a central office location.

HASTINGS, NEB.—The Adams County Telephone Company, which has been granted a franchise by the City Council, is beginning to make preparations to put a first class service in the city, as well as extend the lines into the country and connect up the farm houses. The incorporators and stockholders of the new company comprise some of the leading financiers and business men of Hastings, who made up their minds to give the city a cheap independent service. There is to be expended on the service for the city alone \$30,000.

CENTER SANDWICH, N. H.—The work on the local telephone lines has been begun and the line over to Squam lake will soon be put up.

GLOUCESTER, N. J.—The Eastern Telephone Company is constructing a line to Woodbury.

MT. SALEM, N. J.—A telephone line is being constructed from Colesville and Unionville to Mt. Salem.

BATH, N. Y.—The new line of the New York and Pennsylvania Telegraph and Telephone Company from Watkins to Hector, Smith's Corners, Logan and North Hector, has been completed. The line from Montour Falls to Odessa, Alpine, Cayutaville and Ithaca is also in operation and the one from this place to Townsend, Sugar Hill, Beaver Dams and Monterey will be ready for use in a few weeks.

CANANDAIGUA, N. Y.—The Canandaigua Telephone Company is building a cable line from Saltonstall Street to the lake. The toll line to East Bloomfield and Victor has been connected with the Canandaigua exchange.

CARTHAGE, N. Y.—The Northwestern Telephone and Telegraph Company of this village is about to extend its lines from Philadelphia to Theresa and at Theresa will install an exchange.

EAST AURORA, N. Y.—The Haines Telephone Company is working on the installation of its new telephone line.

EASTON, N. Y.—A telephone line is to be established through this township.

HOPKINTON, N. Y.—A telephone line is being constructed between here and Fort Jackson.

MEDINA, N. Y.—The Orleans County Rural Telephone Company is progressing favorably in its work of connecting the rural sections of this county with telephone service. It has erected poles and established its line throughout Lyndonville and as far as Yates, from which place it intends to extend to Kuckville and Watport. The company will probably connect with Medina through the Home company. The latter company has established headquarters in Medina, and it is expected that its line will be in operation in Medina in about a month. As soon as the Home line is in full operation a rate war is expected.

NEW BERLIN, N. Y.—The Sidney Telephone Company has set poles and is stringing the wires to connect with the New Berlin Telephone Company.

NICHOLVILLE, N. Y.—The telephone poles have been set from North Lawrence to this place and the wire is expected soon. The instruments have been put in.

ONEONTA, N. Y.—The American Telephone and Telegraph Company has a gang of men constructing a line through Oneonta, the line to run from Albany to Elmira by way of Binghamton.

ROCHESTER, N. Y.—The Home Telephone Company has begun the extension of its line through Orleans County. Poles are being placed in Murray, and will be extended to Albion. The Independent lines, including the Citizens' Telephone Company of Albion, have been combined and the extension is to go as far west as Buffalo.

WHITEHALL, N. Y.—The Hudson River Telephone Company has commenced setting poles in this village. The village trustees will compel the company to put many of its wires underground.

DELAWARE, O.—The switchboard for the new Independent exchange here is being installed.

LORAIN, O.—The new telephone system here will be ready for use soon. The poles are nearly all up and most of the wire strung. The cables are all in and the first of the connections are now being made. Arthur Hoge, who has had charge of the work, announces that the new system will be in use by the 1st of October.

NEWARK, O.—Work is progressing on the reconstruction of the Newark Independent telephone plant, but it will be December 1 before the new central energy system is fully established. Pole lines are now being set throughout the city.

ALTOONA, PA.—Work has been commenced on the brick work of the new exchange of the Pennsylvania Telephone Company.

THE WEEKS MESSAGES Concluded

CHESTER, PA.—The Keystone Telegraph and Telephone Company is very anxious to give the residents of Marcus Hook the benefit of the first class service given in other sections of the State, and with this idea in view is making connections through the county, and hopes within a very short time to connect the lines recently erected in the borough with the Philadelphia line. A representative of the company has been working out through the county making Chester his headquarters. The company has had its poles erected and wires strung over the borough streets for some time.

HARRISBURG, PA.—The Pennsylvania Telephone Company, of Harrisburg, has a corps of men stringing four wires for additional toll lines between Harrisburg and Altoona. This is preparatory to ultimately uniting the Central Pennsylvania Companies, to make direct toll charges to all points in the combined territory without using the long-distance lines.

HATBORO, PA.—Work is in progress on a new telephone line from here to Doylestown. Extensions to Newville, Horsham, Jarrettown and Ambler are planned.

LOFTY, PA.—The United Telephone Company is extending its lines to Lofty and Hazleton.

ST. CLAIR, PA.—Workmen are making changes on the lines of the Schuylkill Telephone Company in St. Clair. In the near future a telephone exchange will be established here. Port Carbon will be included in the exchange limits.

CLARKSVILLE, TENN.—Orders have been placed by the Home Telephone Company for all the supplies necessary for the equipment of the plant soon to be established here. The total amount involved in these orders will run well above \$20,000. The material bought will begin to arrive soon, and construction will begin at once. The location of the exchange has not yet been determined.

BLACKSTONE, VA.—The Southside Telephone Company, a local concern which is operating a successful exchange in this place, is now at work putting in an exchange at Crewe. This will be completed within about thirty days, and then the two towns are to be connected by the same system. Already the poles are all up between the two places. Connection will also be had with Nottoway Courthouse, which is between this place and Crewe. Later it is expected for several lines to be run out into the adjacent country.

Miscellaneous

JERSEYVILLE, ILL.—The Jerseyville Telephone Company has completed the connecting lines with the telephone systems at Dow, Otterville, Kane, McClusky, Newbern, Fidelity and Medora.

EVANSVILLE, IND.—Twenty thousand dollars has been subscribed toward the \$190,000 necessary to build and equip a municipal telephone plant. The following have subscribed: R. K. Dunkerson, 200 shares, \$5,000; Francis A. Reitz, 200 shares, \$5,000; James Gray, 200 shares, \$5,000; Philip Skora, 80 shares, \$2,000; Charles G. Covert, 80 shares, \$2,000; Marcus S. Sonntag, 40 shares, \$1,000.

BAINBRIDGE, N. Y.—Several new telephone lines, connecting with the local company's exchange, have recently been put into operation. The names of the companies are: Newton Hollow & West Bainbridge Telephone Company, Yaleville Telephone Line Company, Brackett Pond Telephone Company, and the Bainbridge-Guilford Telephone Company.

COHOCTON, N. Y.—The franchise and local business of the New York and Pennsylvania Telephone Company has been leased for a number of years by E. W. Sutfin. By leasing the system he hopes to make a lower rate to patrons and thus increase the number of subscribers.

MOHAWK, N. Y.—The County Telephone line has been completed to Paine's Hollow.

STANLEY, N. Y.—Farmers in the vicinity of Stanley, Gorham and Hall's Corners, led by Rice McCauley, of this place, are negotiating for telephone service.

WATKINS, N. Y.—The Watkins Telephone Company's line to Moreland and Beaver Dams has been placed in operation.

TOLEDO, O.—The Home Telephone Company will have its new East Side switchboard in operation by September 15. While there has been considerable delay in getting the new exchange in shape, nothing has been left undone that would benefit the service.

INDIANA, PA.—The Farmers' Telephone Company is soliciting subscribers here, and will attempt to place an exchange in the town.

EMMA, TEX.—A new telephone line has just been completed from Emma to Floydada. This gives Emma connection with all railroad points.

MATTHEWS, VA.—The Tidewater Telephone Company has opened an exchange here. This is the third exchange for the company. It now has exchanges at Gloucester Courthouse, Mathews Courthouse, and Saluda, the county seat of Middlesex. There is talk of an exchange at Tappahannock, to be operated jointly by the Rappahannock Telephone Company and the Tidewater Telephone Company. An exchange is needed at West Point as a stepping-stone to Richmond.

FOND DU LAC, WIS.—The Theresa Union Telephone Company, the Allenton-West Bend lines and the East Valley Company have just issued a subscribers' list showing the names and places of business of the sub-

scribers on various lines with all of whom direct connection can be made through the Little Wolf Company, of this city. The stations reached include Theresa, Mayville, St. Kilian, Wayne Center, Elmore, Campbellsport, Kewaskum, Lomira, Byron, Brownsville, Knowles, Le Roy, Farmersville, Ashford, Addison, Kohlsville, Allenton, St. Anthony, Nenno, Nabob, Cedar Lake, West Bend, Waucousta, Dundee, New Prospect, Sand Lake, Beechwood, Scott, Adell, Silver Creek, Boltonville, Armstrong, Pins, Parnell, Cascade.

Personal

CHICAGO, ILL.—Rumors to the effect that John I. Sabin, president of the Chicago Telephone Company, would retire because of dissatisfaction on the part of the large interests in the company, have been officially denied.

VERSAILLES, KY.—Mr. Elmore Oakes, of Portsmouth, O., has been appointed manager of the Versailles exchange of the Fayette Telephone Company.

PITTSBURGH, PA.—The People's Telephone Company has appointed Willard Felts temporary manager of the Pittston department. Mr. Felts has been employed by the company for the past year and during the previous four years was an electrician at Elmira and Avoca. Although comparatively a young man, Mr. Felts is well known, and is deserving of the temporary promotion. It is probable that the company will make Mr. Felts the permanent manager.

PLANTS FOR SALE

FOR SALE.—Whole or part interest in Telephone Exchange. Present yield, 20 per cent; additional installations, 25 per cent. Entire plant, \$4,200. Excellent territory. Address W. HOWARD MEARS, Kasson, Minn.

TELEPHONE PLANT FOR SALE—160 telephones, 100 miles of toll lines; excellent opportunity for extending business; will sell for \$12,000; pays 15 per cent. net on this amount. Address TELEPHONE CO., care of AMERICAN TELEPHONE JOURNAL.

WANTED

EXPERIENCED telephone traveling salesman; acquaintance with Northwest trade preferred, but not essential. Address THE VOUGHT-BERGER COMPANY, makers of telephones and switchboards, La Crosse, Wisconsin.

POSITION by a competent and experienced salesman of electric light, telephone and street railway material, by a young man with 14 years' experience in this business; best of references. Address L. C., care AMERICAN TELEPHONE JOURNAL.

POSITION as manager or superintendent of small exchange; at present in charge of small exchange; 31 years old; married; strictly temperate; references furnished. Address A. B. C., care AMERICAN TELEPHONE JOURNAL.

POSITION as Superintendent or Manager in Telephone System, either on line or in exchange, by a young man of strictly temperate habits. Best of references as to character and ability. Address BOX 21, Oneida, Ill.

POSITION in exchange of from 150 to 500 subscribers as wire chief or inside workman. Have had five years' experience in the telephone business and have thorough understanding of every branch; taking care of five exchanges at the present time. Address, WIRE CHIEF, care AMERICAN TELEPHONE JOURNAL.

POSITION in exchange of from 150 to 500 subscribers, as manager or assistant manager. Experience in construction and switchboard work; best of references. Address JAMES C. THURSTON, North Vernon, Ind.

WANTED.—Position as manager of exchange of 100 or 200 subscribers; or as inspector or traveling salesman for supply house. Eight years' experience; best of references furnished. Address G., Box 125, Monroe, Ga.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISSELL CO., Toledo, Ohio.

WANTED.—A good transfer boy to take care of 125 city and 130 country telephones. State lowest wages and experience. Address VIRGIL A. GEIGER, Churubusco, Ind.

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THE INSPECTION OF INSTRUMENTS (Magneto System.)

By W. H. HYDE.

THE most important part of the telephone exchange business is good service. This cannot be given unless the instruments, lines and switchboards are kept up to their highest working efficiency. To do this a ceaseless watch must be kept by the exchange manager, whose duty it should be to see that a regular inspection of instruments, etc., is made at stated intervals, and not wait until troubles are reported. If instruments are inspected once every three months (quarterly) and everything is given a thorough overhauling managers will find a great reduction in troubles on the daily trouble sheets.

In exchanges of any size the following mode of instrument inspection may be carried out with good results:

Specific instruction for inspecting exchange instruments, for the guidance of exchange managers, whose duty it is to keep the instruments in good working order:—

Arrange subscribers in different routes, for convenience, and visit each subscribers' station at least once every three months, giving each instrument a thorough overhauling, following out the method of inspection given below as nearly as possible.

HAND TELEPHONE

If diaphragm is bent or rusty, substitute a new one.

Paraffine chips that may have shaken down and lodged between pole piece and diaphragm must be carefully removed.

Adjustment of magnet to diaphragm must be verified by the gauge (.015) inches).

Report any broken wood discs or magnets that fail to support the eight-ounce test weight.

BLAKE TRANSMITTER

Diaphragms bent or rusty must be renewed.

Rubber encasing the diaphragm should have special attention, as it is liable to stick to the iron frame; for this reason change its position occasionally. If sticky and in bad order, substitute a new one.

Platinum spring should have following power enough to follow carbon button two-thirds of the distance when held back.

Carbon button should present an unbroken surface, and when worn or blistered must be polished to a new surface. The practice of moving the button from side to side for this purpose

lengthens the carbon spring, destroys its tension and introduces resistance into the primary circuit.

Dampening spring should exert proper tension upon the diaphragm.

Contact points should be soldered, and all working parts of the instrument free from dust and corrosion.

Locks and woodwork must be maintained in a neat and workmanlike manner.

Turn the regulating screw until the carbon button, platinum spring and diaphragm just touch; now, if you want a loose adjustment, give screw one-half turn more; if tight adjustment is desired, give screw one full turn.

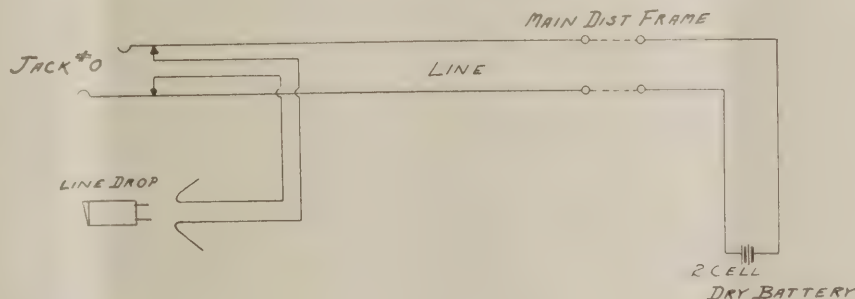
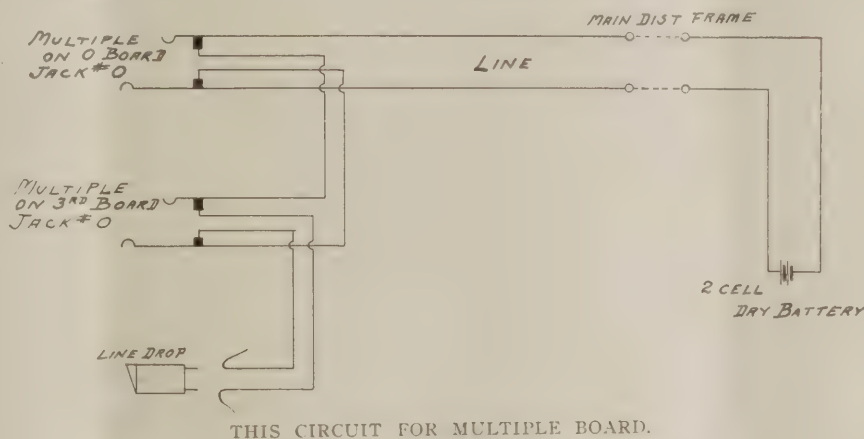


FIG. C.

THIS CIRCUIT FOR SINGLE BOARD.

CORDS

Should be tested carefully for breaks.

SOLID BACK TRANSMITTER

See that batteries are in good condition and all connections in the primary circuit are perfect.

There is little or no adjustment to the solid back transmitter, but if the carbon should become packed, tapping lightly upon the side or top of the case will generally correct this difficulty.

BELLS

Should have wire connections well fastened and all points of contact soldered.

Give special care to dust and corrosion in the hook connections, and tighten all screws.

LE CLANCHE BATTERY

Record your preliminary test with a battery gauge or standard buzzer, and

proceed to careful inspection, as follows:

Zinc must be kept clean and free from crystals and renewed if badly eaten.

The porous cup or bag must be free from crystallized salts.

The jar should be free from crystallized salammoniac. The solution should reach the neck of the jar.

Wire connections must be carefully guarded against corrosion. When these conditions are obtained, make (and record) a second reading of gauge or buzzer. If gauge fails to show a current of 20 degrees or better, or buzzer fails to operate, the fault probably lies with the porous cup or bag.

FULLER OR STANDARD BATTERY

Zinc and connecting wires should be thoroughly amalgamated and free from crystallized salts; renew if badly eaten.

Solution in porous cups should be level with solution in jar, which should fill the jar from two-thirds to three-fourths its capacity.

Cells that are nearly run down can be temporarily improved by pouring a little water into the porous cup. Renew carbons if necessary; those removed may be used again if before they become dry they are put in clean water and well soaked.

DRY BATTERY.

Be sure that all connections are firm and clean. If then the battery fails to "come up" renew, as it is impracticable to recharge them.

Played out dry batteries may be used again for a time by punching holes in them near the bottom and setting them in a jar with a salammoniac solution and using as before.

Inspection Slip.

Form "A"

Exchange.....

Name of Subscriber.....Line No.....

Inspected by.....

Kind of Circuit.....Metallic or Grounded

Hand Number.....

Transmitter Number.....

Solid Back or Blake.....

Style of Battery (No. of Cells).....

Style of Bell.....

The above Telephone has been inspected this date.
.....

Subscriber.
.....190.....

MATERIAL USED

Carbons, Fuller
Cords.....
Cups, Fuller or
Le Clanche..
Dry Batteries..
Jars, Fuller or
Le Clanche..
Mercury
Sal-Ammoniac.
Solution.....
Zincs, Fuller or
Le Clanche..

GROUND WIRE.

Connections must be free from corrosion. Observe the interior wiring and repair all slipshod work, as sagging wires, two wires under the ordinary staple, etc.

In the final test do not rest satisfied until you have obtained the full talking efficiency of the instruments.

After the above inspection of the instrument an inspection slip should be filled out on a regular form (see form A) provided for this purpose, to which the subscriber's signature should be obtained, and the slips turned over to the manager each day.

If the above plan is carefully carried out the manager is enabled to keep "tab" on the daily work performed by his inspectors. The slips should be filed away for future reference if necessary. If a number of exchanges are operated under one management these slips should be sent to the general office monthly, so that the general superintendent may know if the inspection work is being kept up.

TESTING LINES AND SWITCHBOARD CORDS.

In addition to the inspection of instruments, it is a good plan to make a daily test of all the lines and switchboard cords.

The line test should be made from the switchboard before 9 o'clock every morning, as follows:

Have the operator give each subscriber a short ring, and when answered have operator say: "Morning test. Please ring your bell." This gives a test both ways. By urging the subscribers to co-operate in making this morning test, line and also instrument troubles are promptly detected and can be cleared up at once. If any subscriber desires the test made at any special hour a notation to this effect can be noted. A regular blank form should be provided for this morning test for each operator (see form B), so that she may note for each subscriber "O. K." or "Trouble," as the case may be.

SPECIFICATIONS FOR TESTING SWITCHBOARD CORDS.

All switchboard plugs should be cleaned and cords tested once every day by the operators. The exchange manager should thoroughly test all switchboard cords at least once a week.

DIRECTIONS FOR CONNECTING APPARATUS FOR TESTING.

Connect one line which multiplies through the switchboard with two cells of dry battery, annunciator on line to be permanently disconnected. To make it uniform, the zero jack in every exchange should be used.

On small exchange switchboards, where lines do not multiple, connect batteries with zero jack and disconnect drop from back contact of same. (See Fig. C.)

THE CORD TEST.

To test a switchboard cord, the cam lever should be down, connecting the instrument with the particular pair of cords to be tested.

Insert back plug of pair in the "test" or zero jack and move the cord from side to side. If a scratching sound is heard, some of the tinsel strands in cord are broken, and cord should be repaired or replaced by new one.

The front plug of pair should be tested in like manner. Each pair of cords should be tested separately.

FORM "B."

Board No.....Date.....190

0	10	20	30	40	50	60	70	80	90
1	11	21	31	41	51	61	71	81	91
2	12	22	32	42	52	62	72	82	92
3	13	23	33	43	53	63	73	83	93
4	14	24	34	44	54	64	74	84	94
5	15	25	35	45	55	65	75	85	95
6	16	26	36	46	56	66	76	86	96
7	17	27	37	47	57	67	77	87	97
8	18	28	38	48	58	68	78	88	98
9	19	29	39	49	59	69	79	89	99

FORM "B" REDUCED ABOUT ONE-HALF.

If either conductor of the cord is entirely broken, or if cord or plug is on short circuit, no click will be heard when plug is inserted or removed from test jack.

If a cord or plug is found defective and cannot be replaced at once it should be marked "Out of service" or "Turned up," and replaced as soon as possible.

A clean plug and good cord will give a clear, sharp click when plug is inserted or removed from "test" jack.

To perform the inspection work thoroughly, the inspector should be provided with the following outfit:

- Satchel.
- Pair side-cutting plyers.
- Pair long-nosed plyers.
- Screw driver.
- File.
- Tack hammer.
- Battery gauge, or buzzer.
- Eight-ounce weight for testing hand telephone.
- .015 gauge for testing hand telephone.
- Soldering lamp, iron and solder.
- Emery cloth, size (0000).
- Chamois skin, cloth and polishing paste.
- Small bottle of oil.
- Dusting brush.
- Box containing screws, staples, washers, etc.
- Tape, insulating wire, etc.
- Diaphragms, rubber bands, carbon springs, buttons, etc.
- Inspector's scissors.
- Candle.
- Battery material.

LONG DISTANCE TELEPHONY—IV.

By P. KERR HIGGINS

NO definite rule can be laid down as to the number of transpositions necessary. In Figs. 10, 11, 12 are given the standard methods of transposition, and these will meet all ordinary conditions. The poles are marked, starting with A, and progressing as shown in the figure; it is well to note that when C is reached a start is again made at B, so that after each C, B is repeated; it will be observed also that the transpositions are made irregularly and yet are regular in relation to each other, so as to meet the conditions created by the position of the wires. When high

is 1,300 feet apart. The center pins, 5-6, usually take the C transposition, as these pins are generally occupied first on a cross-arm line.

After the line has been completed, if it is noisy, a test should be made to see that the insulation is good and, if so, then cut in on the line at a balance point. This would be each second transposition from the point you were testing with. By following up this test, one can easily run down the unbalanced condition, and by inserting one transposition in the center of the unbalanced section, clear the trouble. In cutting in extra transpositions on

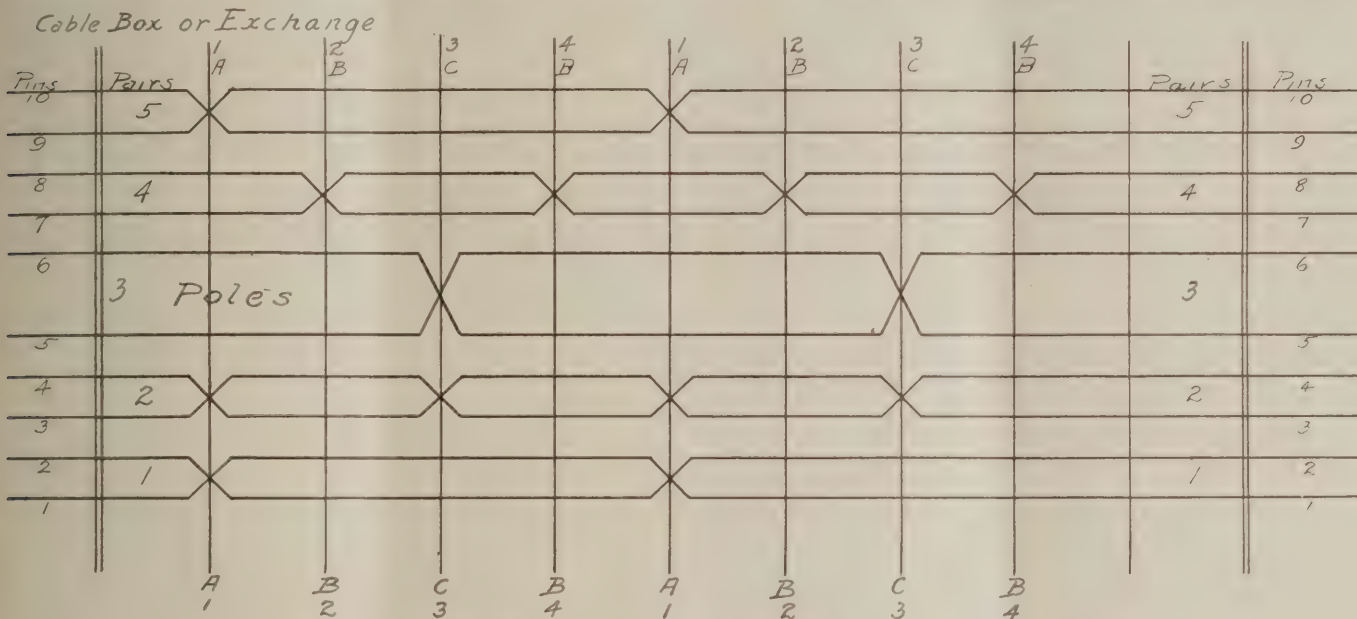


FIG. 10.—METHOD OF TRANSPOSING FOR CROSS-ARMS NUMBERED 1, 3, 5, 7, 9 (ODD NUMBERS).

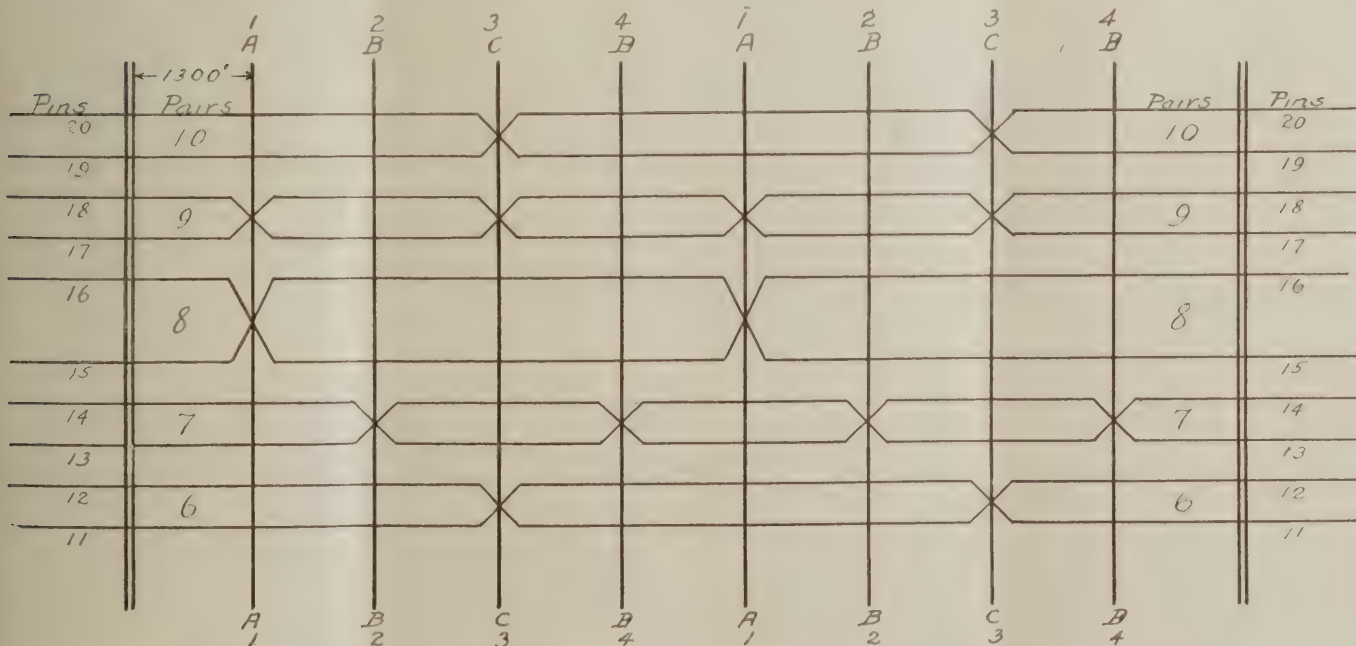


FIG. 11.—METHOD OF TRANSPOSING CROSS-ARMS NUMBERED 2, 4, 6, 8 (EVEN NUMBERS).

tension circuits, or other foreign wires, parallel the toll line, additional transpositions are often found necessary. The plans shown in Figs. 10 and 11 are for two cross-arms, and the same transpositions are repeated on the third and fourth, and so on. It is possible to plan transpositions for a given line beforehand, but it will often be found necessary to considerably modify the plans after the line is completed. It is usually easier to balance long lines than short ones and fewer transpositions are necessary, because the induced currents have more opportunity to neutralize each other on the long lines. It will be observed also, that each letter

a full cross-arm, or on one having more than one circuit, great care must be taken not to throw the wire in trouble out of balance with the other circuits, as this would produce cross-talk between the circuits. If a branch line leaves the main line, then the transpositions must be continued on the new line. It is found very convenient to number every transposition so that when trouble has been located by testing, the place may be designated on the order to the toll troubleman, and he can often take a train directly to or near the point indicated. All transpositions are counted from a designated center, for the sake of uniformity.

TYING-IN WIRES.

Where copper wire is used, the tie wire should be of the same gauge, rendered soft by heating and tied as shown in Fig. 14. Five complete turns are generally made on each side of the

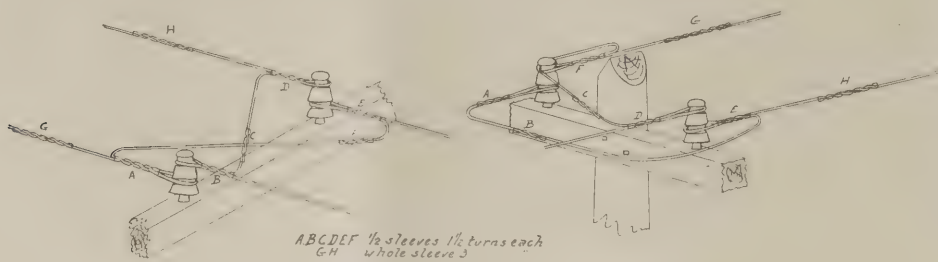


FIG. 12.—METHOD OF MAKING TRANSPOSITIONS.

insulator. At corners and bends the wire must always be placed on the outer side of the insulator in relation to the curve.

RAILROAD CROSSINGS.

Great care must be taken at railroad crossings, that the wire is not too low and that guards are provided, as shown in Fig. 15. The height of poles at these points should permit of the lowest wire being at least 28 feet clear of the rails. It is usual

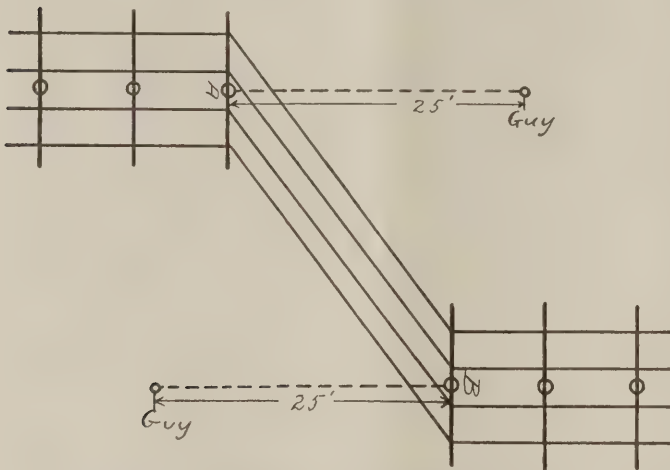


FIG. 13.—USED IN ARTICLE III. REPRODUCED FOR READER'S INFORMATION, SHOWING METHOD OF GUYING AT ROAD CROSSING, ANGLE OF 45 DEGREES. POLES A-B TO SET 6 FEET IN GROUND AND WELL BRACED UNDER GROUND.

to make the guard wire of No. 9 iron, securely fastened to the pole, or cross-arm, by fence staples.

TOLL STATIONS.

Where these are cut in on the line, the wire should be carried up close to the station, and from there the office wire is run to the instrument. It is good practice, when using duplex (braided) twisted wire, not to expose the insulated wire to the weather more than is absolutely necessary.

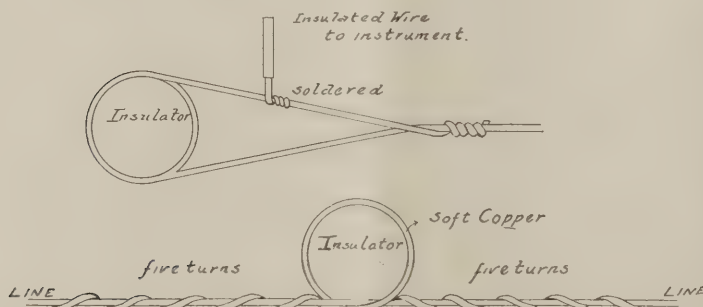


FIG. 14.—METHOD OF TYING IN WIRE TO INSULATOR.

TOLL STATION EQUIPMENT.

The toll station equipment consists of the following: Standard bi-polar receiver; standard long distance transmitter; 2 cells of Lee-Fuller battery; 1 magneto bell (or generator); 1 fuse block (lightning arrester); 1 toll station sign. The whole is to be mounted on a back-board, or fitted up in the form of a portable set.

The generators should be capable of ringing through at least 10,000 ohms resistance, and on bridging systems the ringer spools are usually wound to 1,000 ohms, made up of 12,950 turns of No. 36 B. & S. wire. Sometimes a 2 M. F. condenser is placed in

series with the ringer (Fig. 16), between the two spools for convenience in testing where several stations are on the same line. The writer personally conducted several experiments with this arrangement, and found it quite satisfactory. Occasionally the condenser will be short-circuited by lightning discharge, but very seldom where apparatus is properly protected. When privacy is necessary a silence booth may also be added to the equipment. Great care should be taken to have good ground connection to the lightning arrester.

METHOD OF CONNECTING UP STATIONS.

The day of connecting up toll stations in series has passed,

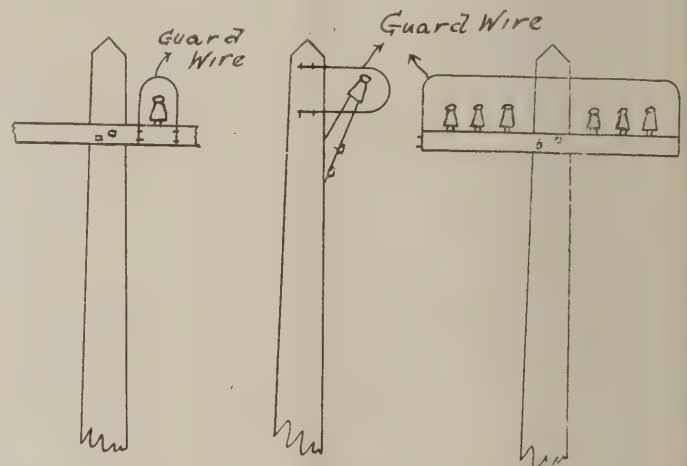


FIG. 15.—METHOD OF GUARDING WIRES AT RAILROAD CROSSINGS.

and all stations are now bridged (Fig. 17) across the line and a non-inductive resistance coil of 500 ohms is usually connected in series with the secondary of the induction coil at all toll stations. This also prevents loss of efficiency, caused by some one on the same line taking down the receiver while a conversation is going on.

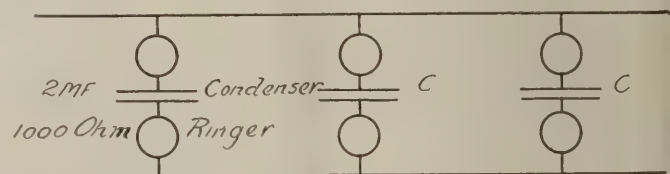


FIG. 16.

In conclusion, it may be said that the poor construction hitherto indulged in by many companies was apparently due to lack of appreciation of the future demands upon the line, and a lack of faith in the success of the undertaking. It seemed foolish to them to install 25 or 30 foot poles when apparently a 20 foot pole would serve just as well. They are now finding out their mistake. It seems too bad that many of those entering the telephone field should have to go through the same experiences as the Bell Company did in the early days of telephony. Let us

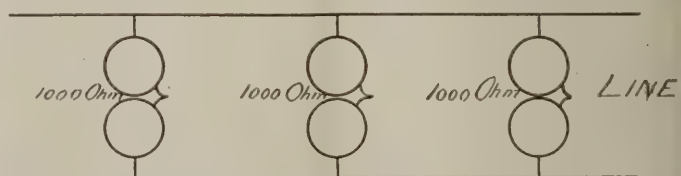


FIG. 17.

hope that this is now a thing of the past, and that as in building a new central office, so may it be in toll line construction, that the ultimate extent and future requirements of the line shall be fully considered.

CONTEMPORARY CROSS TALK

IN OUR last talk we ran hastily over the history of the development of the telephone from its early experimental days to the present highly organized and complicated collection of machinery that most people really refer to when they speak of "the telephone." It was hinted, also, that as regards the telephone business we are on the threshold of a development in the use of the telephone that will eventually carry it into every household, and cause it to be considered as much of a household necessity as water, light or heat. Many people already so regard the telephone service, but there is a much greater number that yet have to become converted, and the field that is yet untilled is immensely more vast than that which has already yielded such fine results to telephone managers and such handsome profits to telephone investors.

* * *

There is a very vital point in connection with this question of telephone development which the telephone manager must keep well in mind. Briefly put, it is this: That it is just as important to develop the use of the telephone service by each customer as to develop the number of customers that use the service. In fact, it is even more important, because it is by increasing the usefulness of the telephone, by making the subscribers depend upon it for every little thing, that you accomplish a double object. You obtain a paying load that enables you to make a cheap rate for your messages, and your customer comes so to depend on the service and to recognize its value to him that he not only pays his bills cheerfully, with a feeling of value received, but becomes a walking advertisement for the telephone service; he goes about saying he could not possibly live without it and advising everybody who has not got a telephone to have one put in at once.

* * *

It is quite plain that the telephone is being used by many more people than it was a few years ago, and it is comparatively easy to find plenty of new subscribers for every telephone system that gives a good service. But it is not so plain that each subscriber is using the telephone more than he did even quite a number of years ago. The average traffic of the local telephone line seems to remain stationary, and only in rare instances exceeds the usual average that has obtained for many years past—about eight or ten calls a day. The conspicuous exceptions to this general average are those cases where a very low flat rate has been made for service in a large city. In such cases, where there is no restriction on the use of the service and there is an active demand for quick communication, as there is in any big city, the average telephone traffic goes up very quickly. It will be remembered that the Maryland Telephone Company, in petitioning to be allowed to raise its rates or to adopt message rates in Baltimore, alleged that the traffic originated by its Baltimore subscribers was so heavy that the business was being carried on at a loss. This shows that in an active and populous city the use of a cheap and efficient telephone service is likely to be much larger than the generality of figures for average traffic would seem to indicate.

* * *

The case of Baltimore is a highly interesting one for two reasons. First, it demonstrates strikingly the fallacy of flat rates. Some might say that it merely showed that the rate was fixed too low in the first place, which merely brings us back to the old difficulty—that a flat rate must either be fixed so high that it will frighten away business, or it will sooner or later be overtaken by the expenses if it is fixed low enough to attract a large subscription list. This is the dilemma that faces the flat rate in large cities. The second interesting point demonstrated by the Baltimore discussion is that under favorable circumstances a high average traffic will be developed in a city telephone system. That is exactly the point we are after. To operate a telephone system economically, and to make message rates attractive, it is necessary to get a large average traffic from each line, and the case of Baltimore shows that the demand for local telephone communication in large cities is strong enough to cause a high average traffic to appear if there is no restraining influence.

* * *

That brings us up to the message rate dilemma, for telephone rates are such a vexing problem that each system, flat and message, has its own peculiar difficulties. Message rates do exercise a restraining influence on the use of the telephone; there is no doubt about it. Telephone subscribers have been brought up on

flat rates, and the general idea about the telephone is that it costs the telephone company no more whether you use it only a few times a day or a great many times a day. Consequently, many unthinking persons rather resent paying for telephone service by the message, and, whether they resent it or not, the fact that each message has to be paid for and represents a charge by itself is a deterrent to a generous use of the service such as quickly comes about under a cheap flat rate. Therefore message rates have a tendency to keep down the average traffic and to restrict the use of the telephone to messages that are considered absolutely necessary. But it is only when the average traffic is large and the use of the service generous that the message rate becomes cheap, for then the wholesale principle comes in and the cost per message for large numbers of messages is lower than the cost per message for small numbers of messages.

* * *

Here we see plainly the dilemma of the message rate method of charging. When the idea of charging by the message is thoroughly accepted, and when it is plainly understood that each message is an individual transaction, like a letter or a telegram, then the use of a large number of messages makes the service look cheap, because the average cost of each message is low. But the very fact of there being a charge for each message prevents most people from using many messages, and so in the majority of cases does not bring into operation the wholesale principle that appeals so readily to every commercial mind. Consequently, the message rate to a certain extent works against itself by interposing a restraining influence to prevent the free and general use of the telephone, which is the very thing that would make the message rate seem cheap. So far almost every system of message rates has had a minimum charge, sometimes including a certain number of messages and sometimes not covering any messages at all, and the average telephone subscriber reckons that his messages cost him whatever this minimum charge may be, divided by the number of messages. That makes the first few hundred messages seem rather dear, and it is only when the traffic gets fairly high and the number of messages used fairly large that the price per message seems low.

* * *

There have been proposals to charge by the message only, with no minimum rate and no annual charge for the maintenance of the line and station. A company in a New Jersey town announced not long ago, according to a paragraph that went the rounds of the daily papers, that it was going to furnish telephone service at a rate of one cent a call, with no minimum rate and no maintenance charge. As far as is known that system is not yet actually in operation, and the announcement, for that matter, was not taken very seriously by telephone men, who well understand that such a rate could not be profitable. A writer in the *AMERICAN TELEPHONE JOURNAL* recently advocated a somewhat similar plan, advocating that the telephone company should own the switchboard and wire plant, and that the subscribers should buy their own station apparatus and pay the company for the service actually rendered. At present it is general practice to charge an annual rate to cover the fixed charges on the line and station and share of central office plant, but it would seem that eventually telephone companies will have to come to furnishing telephone service by the message pure and simple. Then there will not be the stumbling block to the free and generous use of the service that the fixed annual rate, either in the form of a minimum rate covering a certain number of messages or of a maintenance charge, seems to offer.

The Listening Key.

OMITTED FROM DIRECTORY, WANTS DAMAGES

THE fact that his name was omitted from a telephone directory is the cause of a \$10,000 damage suit filed in Common Pleas Court of Cleveland, Ohio, by Charles Richter, a real estate dealer of that city. Mr. Richter says he is a patron of the Cleveland Telephone Company, and that when the last directory of the company was issued his name was left out. He says that the greatest part of his business is dependent upon the telephone, and alleges that he noticed a great falling off in his business, but could not account for it until a friend asked him why he had given up his telephone. He says he then discovered the cause of the decrease.

PROCEEDINGS OF THE KANSAS STATE CONVENTION

MR. PRESIDENT, I have never attended a convention of the Bell people, nor have I ever been asked to one. Yet I notice some representatives of our arch-enemy here. I move sir, that this convention go into executive session, and that all friends of our opposition be removed. Let the unwashed go!"

The above statement from a delegate to the Kansas Association Convention, at Kansas City, Mo., September 11 and 12 last, created a mild sensation, and resulted in prolonged cheers. It came right in the midst of an address by Hugh Dougherty, of Indiana. Mr. Dougherty was giving to the convention a report on some patent suits Independent telephone men are defending. He had proceeded some way with his report, when a delegate arose and sprung the above startling allegation. The resolution was unanimously adopted, and only recognized members and friends of the Association were permitted in the convention hall.

THURSDAY MORNING SESSION.

President A. R. Champlin called the Convention to order in the parlors of the Coates House. He introduced James A. Reed, Mayor of Kansas City, who welcomed the delegates to the city. The Mayor has always been a consistent friend of the Kansas City Home Telephone Company. The following remarks in the course of his address tend to show that he, despite all that has been said by the Bell interests, has implicit confidence in the integrity of the Kansas City Home Company, and its backers:

"The present conditions of the telephone business are lamentable. If relief is to come to the people it must come either from legislation of the most radical character or through an intelligent union of Independent systems, managed along honest lines and by honest men. That, of course, leaves out the Bell company, which is nothing better than a pirate.

"The Bell company, which never did an honest act in its life, takes out of Kansas City, at a low estimate, \$300,000 annually, and swears to the assessor that the value of its entire property in Jackson County is \$22,000.

"I will not extend to you the liberties of the city, for I know that if you have occasion to use a Bell telephone you will violate at least one of the commandments, if not the laws of the State.

"It is the hope of the people of Kansas City that the new company forming here will solve the problem. It never has sold out, and I don't believe it will. It will connect with every Independent line in Kansas and Missouri that desires connection, and the people of your cities and of Kansas City will receive a mutual benefit. Your efforts should be toward such a consolidation as will give good service and relief from the present oppressive rates."

W. H. Nelson, of Smith Center, Kas., replied to the Mayor's address, and thanked him heartily in behalf of the Convention for his attitude. He said the Independents of Kansas would do their part in furthering the Kansas City Independent Company by building toll line connections, etc.

Committees on credentials, amendment, and revision and resolutions were appointed by President Champlin, and reports of the Secretary and Treasurer of the Association read. The Credentials Committee, in the interim, met and passed on the credentials of delegates present, and then reported to the Convention. Many new members were received into the Convention. An adjournment was taken until 2 o'clock.

THURSDAY AFTERNOON SESSION.

At the afternoon session Mr. Dougherty was the first speaker. He was in the midst of an address in connection with the patent litigation, when the sensational allegation at the beginning of this report was made.

The Convention immediately ejected the alleged Bell spies, and went into executive session behind closed doors.

Since the last meeting of the Association, when it was organized, numerous new toll lines have been built in Kansas. It was for the purpose of locating these and to agree on a working basis for them, and also to provide for others, that the Association had primarily assembled. All of this was now discussed in detail, and, as a result, announcement of several important new projects may be looked for in the near future.

A paper on "Construction and Maintenance of Metallic Toll Lines" was read by Harry Faris, of Concordia. W. W. Dilworth, of Beloit, read a paper on "Enforcement of Message Time

Limit." These papers were fully discussed by delegates. The secretary gave a report which showed that 85 per cent of the larger Independent companies in the State now belong to the Association.

Short talks were then made on various Independent systems in the State as follows: D. A. Van Trine spoke encouragingly of the Independent plant at Salida; Edward H. Berry told what had been accomplished at Atchison; B. F. Pankey told of the Topeka plant; Frank L. Brown talked of the Wichita plant, which has nearly driven the Bell plant there out of business, and detailed the war between the city and the Bell company.

James S. Brailey, Jr., of the Kansas City Home Company, in a short talk on the prospects of that plant, said that, while Toledo and Louisville were conceded to have most excellent systems, he could promise that the plant of the Kansas City Home Company would be the model system in the United States. He said it would start July 1, 1903, with a capacity of 7,500 lines, which, he hoped, would be increased in a couple of years to 25,000.

The Convention adjourned until Friday at 10 a. m.

Thursday night the delegates were entertained at a theater party by the Kansas City Home Telephone Company and the Kansas City telephone manufacturers.

FRIDAY MORNING SESSION.

The Committee on Amendments and Revisions, which had the matter of revising and amending the by-laws and constitution in hand, reported as soon as the Convention was called to order. After a thorough discussion, their report was adopted. An informal discussion of Kansas telephone conditions followed, after which an adjournment was had until 2 p. m.

FRIDAY AFTERNOON SESSION.

At the afternoon session a paper on "Central Energy for Small Exchanges," by J. J. Nate, was read.

Plans for the organization of three new toll lines in Kansas, to connect with the plant of the Kansas City Home Company, were then discussed.

The Committee on Resolutions reported several resolutions, including a resolution of thanks to Mayor Reed. Messrs. Barber and Brailey, who are building the Home company's plant, were thanked for courtesies extended to the delegates, and the Association tendered its enthusiastic support to the Kansas City Home Telephone Company.

Before adjournment the following resolution was adopted, it being practically the same one adopted at the recent New York State meeting at Rochester:

The Kansas Independent Telephone Association, in convention assembled at Kansas City, Mo., on September 12, 1902, hereby adopt the following:

Whereas, almost all the States have Independent telephone associations made up of the Independent telephone companies in their respective states; and whereas there is at the present time no co-operation or unity between the different State associations; and whereas, it is the sense of this Association that the various State associations should meet together in convention some time during the fall of 1902, and form a plan for co-operation or united action among the State associations, therefore be it

Resolved, First: That this Association hereby agrees to elect delegates to meet with delegates from other associations at a convention or meeting called by the presidents of the State association approving this action.

Second: That the various State associations at meetings which they may hold shall elect delegates to such convention and empower such delegates to act for their respective associations.

Third: That this Association shall elect four delegates at large, and one additional delegate for each three thousand telephones, and one for every thousand miles of metallic circuit toll line, to represent the Kansas State Independent Telephone Association at said meeting or convention, and that the other State associations joining said convention elect delegates on the same basis of representation.

Fourth: That this Association is not taking this step as being against the interests of any other telephone association heretofore formed, but for the purpose of bringing the different State associations together and then to take such steps as may be deemed best for the interests of the associations represented by the delegates at such meeting.

All business before the Convention being disposed of, an adjournment was moved until next January, when the Association will probably meet at Topeka, Kas.

PROCEEDINGS OF THE KANSAS STATE CONVENTION

TELEPHONE OPERATORS PRESENT

E. Armstrong, Greenleaf Telephone Company, Greenleaf.
 E. H. Berry, Atchison Telephone Company, Atchison.
 D. D. Brownell, Belleville Telephone Company, Belleville.
 W. E. Bolton, Home Enterprise Telephone Company, Woodward, Okla.
 Jas. S. Brailey, Jr., Home Telephone Company, Kansas City.
 Edward L. Barber, Home Telephone Company, Kansas City.
 J. E. Byers, Ottawa Telephone Company, Ottawa.
 Frank L. Brown, Wichita Telephone Company, Wichita.
 C. L. Brown, Brown Telephone Company, Abilene.
 R. L. Burns, B. & B. Telephone Company, Hutchinson.
 A. R. Champlin, Newton Telephone Company, Newton.
 W. H. Caman, Winfield Telephone Company, Winfield.
 H. A. Cheney, Emporia Telephone Company, Emporia.
 F. M. Dolan, Clifton Telephone Company, Clifton.
 F. W. Dougherty, Concordia Telephone and Telegraph Company, Concordia.
 W. W. Dilworth, Beloit Telephone Exchange, Beloit.
 J. M. Doyle, Belleville Telephone Company, Belleville.
 J. M. Dosbaugh, Dosbaugh Telephone Company, Cedar Vale.
 F. L. Flint, Minneapolis Telephone Company, Minneapolis.
 E. F. Frisbie, Concordia Telephone Company, Concordia.
 W. B. Grimes, Grimes L. P. and P. Company, Great Bend.
 Theodore O. Jackson, Frankfort Telephone Company, Frankfort.
 E. P. Kellam, Chase County Telephone Company, C. W. Falls.
 C. H. Kimball, Kansas Telephone and Telegraph Co., Parsons.
 E. A. Lankford, Cawker City Telephone Exchange, Beloit.
 J. G. Lee, De Soto and Olathe Telephone Company, De Soto.
 R. M. Martin, Savannah Telephone Company, Savannah.
 C. H. Munsell, Northeast Kansas Telephone Company, Hiawatha.
 E. Mitchell, Mitchell & Williams Telephone Company, Valenciana.
 Anson Miller, Council Grove Telephone Company, Council Grove.
 J. J. McCullough, Herington Telephone Company, Herington.
 W. A. McCullough, Herington Telephone Company, Herington.
 W. H. Nelson, Exchange Telephone Company, Smith Center.
 W. C. Polk, Home Telephone Company, Kansas City.
 B. F. Pankey, Topeka Independent Telephone Company, Topeka.
 W. T. Perry, Belleville Telephone Company, Belleville.
 H. L. Prew, Belleville Telephone Company, Belleville.
 J. M. Rings, Oswego Telephone Company, Oswego.
 E. A. Reaser, Home Telephone Company, Kansas City.
 D. K. Rinchar, Rinchar Telephone Company, Holton.
 M. L. Robeson, Galena Telephone Company, Galena.
 E. P. Snowden, Interstate Telephone Company, St. Joseph, Mo.
 G. H. Spangle, Chetopa Telephone Company, Chetopa.
 O. C. Snider, Home Telephone Company, Kansas City.
 J. W. Smith, Minneapolis Telephone Company, Minneapolis.
 T. Sexton, Augusta Telephone Company, Augusta.
 William F. Siker, Wellington Telephone Company, Wellington.
 C. C. Van Deventer, Kingman Telephone Company, Kingman.
 James E. Wright, McPherson Telephone Company, McPherson.
 C. E. Wells, Southwest Telegraph and Telephone Company, Marion.
 C. M. Young, Council Grove Telephone Company, Council Grove.

REPRESENTATIVES OF SUPPLY HOUSES

There was a large attendance during the two days' session of the Convention of representative telephone manufacturing and supply houses from all over the country. Their exhibits in the hotel lobby, in the parlors and in various rooms made the house looked like a telephone exchange or a manufacturing plant. Among the well-known representatives of prominent houses present were the following:

G. H. Lutz, Kellogg Switchboard and Supply Company, Chicago.
 H. N. Farris, Kellogg Switchboard and Supply Company, Chicago.
 S. J. Baer, American Electric Telephone Company, Chicago.
 E. W. Barnes, American Electric Telephone Company, Chicago.
 P. J. Hertz, Illinois Electric Specialty Company, Chicago.
 F. E. Rotchka, Sterling Electric Company, Lafayette, Ind.

C. W. Bartlett, Stromberg-Carlson Telephone Manufacturing Company, Chicago.
 E. B. Overshiner, Swedish-American Telephone Manufacturing Company, Chicago.
 W. O. Rhode, Swedish-American Telephone Manufacturing Company, Chicago.
 S. A. Dinsmore, Electrical Appliance Company, Chicago.
 C. H. Wallis, Central Telephone and Electric Company, St. Louis, Mo.
 W. W. Townsend, Townsend Cedar and Supply Company, Chicago.
 George W. Conover, Chicago.
 J. H. Montague, Ericsson Telephone Company, New York.
 E. J. Pietzeker, American Steel and Wire Company, Chicago.
 George L. Moselle, the Controller Company of America, St. Louis, Mo.
 F. N. Cochran, the Controller Company of America, St. Louis, Mo.
 E. E. Epperson, the Controller Company of America, St. Louis, Mo.

CONVENTION NOTES

The B. R. Electric Company, of Kansas City, distributed to the delegates and visitors a handsome aluminum badge. This house, well known in the electric light and power industry, is now carrying a full line of telephone apparatus and supplies.

The Kansas City Home Telephone Company directors met on September 12 and increased the capital stock of the company to \$3,000,000.

Messrs. Barber and Brailey took the delegates, after the adjournment of the Convention, September 12, on a tour of inspection of the conduit work being done for the Kansas City Home Telephone Company. The delegates were very favorably impressed, and many remarks were heard to the effect that it certainly "looked like business." Most of the delegates were from small towns, where nothing but overhead wires are in use, and later discussed favorably the advisability of introducing conduits on their main streets.

Kansas City telephone users and prospective users enthusiastically welcome the Independent invasion of the local field. They are thoroughly disgusted with the service given by the Bell company, which is wretched.

One of the most enjoyable incidents, from the standpoint of pleasure, was the theater party on the evening of the 11th. The delegates were entertained at the Willis Wood Theater, the finest one in Kansas City, by the officers of the Kansas City Home Telephone Company and the dealers in telephone supplies engaged in business in Kansas City.

Probably the most important business matter disposed of by the Convention was that relating to the toll lines of the State and arrangements for toll lines to connect the new plant building in Kansas City.

OF INTEREST TO TELEPHONE USERS

IN BERLIN a legal decision was recently rendered which is of interest to every business man in every country who uses a telephone.

A merchant one day sent an order by telephone to a firm, and, as the order was not carried out to his satisfaction, he sued for damages, claiming that the person at the other end of the telephone to whom he had given his order was responsible for the loss.

The court, however, decided against him, and refused to award any damages on the ground that, as a rule, the person who goes first to a telephone and asks to be put in connection with another person must bear the consequences of any loss which may be the result of such a conversation.

The court admitted that the person to whom an order might be sent in this way might not catch all the words, or might fail to understand their full import, but it insisted that it would be contrary to all the principles of law to hold him responsible on that account.—*Sentinel*, Wheeling, W. Va.

Opinion and Comment

HUSTLING KANSAS

THE reputation of Kansas for hustling was ably maintained at the convention of the State Independent Telephone Association, held at Kansas City last week. The delegates at this convention, representing practically all the companies, large and small, operating in the State of Kansas, set an example that might well be followed by many of the larger associations. From the moment that the chairman's gavel fell until the meeting was adjourned practically the entire time was devoted to discussing questions that will make for the betterment of the Independent telephone business in Kansas. No time at all was wasted on side-issues. The delegates were a lot of bright, wide-awake men, and they told a story of business development that ought to be very pleasing to every friend of the Independent movement.

From practically nothing the Independents in Kansas have grown to be a sturdy, thriving body, controlling absolutely the telephone situation in many of the most important centers in the State. In the country districts, the reports of the delegates showed, lines are springing up everywhere. The only thing that is needed now is an extension of the toll service, and this is assured. The most important step in this direction will undoubtedly be the completion of the Home Telephone Company's plant at Kansas City, which will give the Independents an entrance to a most important field in Western Missouri, where heretofore they have been barred.

Not the least important service rendered by the convention was that it cleared the atmosphere so far as the Home Telephone Company in Kansas City is concerned. The Bell company, employing tactics not unusual to it, had managed through newspaper influence to surround the operations of Messrs. Barber and Brailey, who are installing the Home Company's plant, with all sorts of false impressions. The new company, it was alleged again and again in the public prints, was simply a dummy. It would sell out to the Bell as soon as its plant was completed. Its agents were the agents of the Bell, etc. By these procured publications suspicion was planted all along the line.

To any one who knows the telephone situation in the United States these attacks were, of course, absurd. The position of Messrs. Barber and Brailey in the Independent field is so thoroughly understood that no one who is in touch with the situation paid any attention to these reports. But the average layman knows nothing about the inner workings of the telephone fight, and it was not unnatural that the people of Kansas City should have taken seriously the innuendoes that were so carefully spread. The action of the convention in giving the enthusiastic indorsement of the delegates to the Home Company will, or ought to, put an end to the contemptible warfare that has been waged, for not even the most skeptical citizen of Kansas City will credit false rumors hereafter in face of the convention's declaration, and no newspaper, no matter what influence is brought to bear, will have the temerity to continue in its attacks on the Independent company. It is characteristic of the Bell that it should have fought up to the last moment, planting spies in the convention. The ignominious expulsion of these spies was in itself a fine object lesson for the people of Kansas City. Altogether, the work of the men from Kansas was admirable and bound to produce excellent results.

CENTRAL ENERGY FOR SMALL EXCHANGES

MR. J. J. NATE'S paper before the Kansas City Convention, in which he advocates the adoption for small exchanges of the central energy system in spite of the somewhat greater first cost as compared with local battery systems, does not nearly exhaust the arguments in favor of the use of central energy equipment for exchanges of all sizes. The main objection to building a small exchange on the central energy system is the greater capital cost of the exchange equipment, but the force of this objection is largely removed when the lower cost of operation and maintenance and the improved efficiency of the service are taken into account.

One very important point for Independent telephone men to consider is this: That in starting telephone systems at the present time they are enabled to profit by the experience of others gained in twenty-five years of pioneer work in telephony. This should be a great advantage, but it has often been availed of so little that many Independent plants have been built that in point of efficiency would compare by no means favorably with telephone systems of twenty years ago. As a general rule such plants have had to be rebuilt or have continued giving an indifferent service and crying out for rebuilding because there was not money enough available to pay for reconstruction. This is throwing away a very positive and distinct advantage. All experience in telephony has shown that a thoroughly substantial line and instrument is absolutely necessary for the rendering of an efficient telephone service, and the very latest experience has fully demonstrated that the most effective method of operating a telephone exchange system is the central energy method.

Now one great point about central energy supply is that it absolutely demands a substantial and carefully built line plant, and requires the whole system of wires, connections and apparatus to be kept constantly up to concert pitch. Troubles that might lie long dormant with local battery working reveal themselves very quickly with central energy, and more care has to be exercised in guarding against troubles and greater rapidity in removing them. Thus central energy sets a standard for line construction and for line and general maintenance, which is by no means one of the least of its advantages. Even if it is only because central energy in the exchange requires all the rest of the work to be good and the supervision to be constant, and searching, it would be worth adopting had it no other advantages.

As to small exchanges, who is to say in these days of rapid development and quick building of telephone lines, how long a small exchange will remain small. The increase of subscribers in almost every exchange that has been built has been far greater than its promoters anticipated, and the tendency is constantly to spread telephone service over wider areas, to join neighboring towns and villages together and to make large systems out of several small ones. This work will be much facilitated by uniformity of equipment, and an original start on correct lines will in a great many cases avoid subsequent waste of money due to throwing out the wrong thing and putting in the right after a few years working. Broadly speaking, there is no exchange too small to adopt central energy equipment.

IN THE OPERATING FIELD

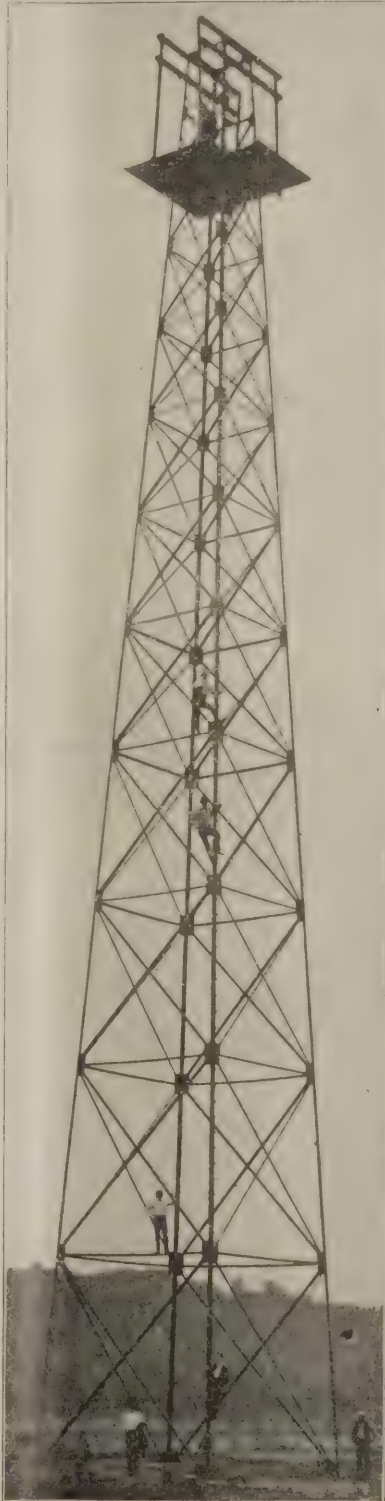
STEEL CABLE TOWER ON THE OHIO RIVER

THE United States Telephone Company has just completed two steel towers on the Ohio River, one in the city of Huntington, W. Va., and one in Rockwood, Ohio, opposite, for the purpose of carrying its long distance lines across the river aerially. As will be seen by the accompanying cut, these towers are exceptionally heavy in construction, this being necessary on account of the number of circuits which they will ultimately carry, the length of the span, and the height necessary to clear the wires above boats in times of high water. Each tower is 125 feet high, 16 feet at the base, 4 feet at the top, and contains about 8 tons of steel. They are bolted to concrete foundations with twelve $1\frac{3}{4}$ " x 5' 0" bolts.

A feature in connection with the construction of this river crossing is the manner in which the wire is suspended and fastened. To the steel work are bolted 6x6-inch oak cross arms 12 feet long, capable of carrying four circuits each. Eye bolts suspending a steel pin upon which a porcelain roller revolves are fastened to the cross arm. The wire is passed over these rollers and fastened to the first pole from the tower, thus taking all of the lateral strain off the towers and also making it a very easy and simple matter to cut it or take up slack, as may be required.

The wire used was No. 8 B. & S. gauge phono electric, and in the span of a little over 2,000 feet was given a dip of about 30 feet.

The completion of this crossing is a great help to the Independent Companies throughout Ohio, West Virginia and bordering States, as it gives the thousands of Independent telephone users throughout the central part of West Virginia an opening to the manufacturing and commercial centers of the surrounding States. It gives the rich coal fields an opening to the Great Lakes and iron manufacturers of Ohio, and gives those interested in river shipping service they have never been able to obtain before. It is another link in the longest Independent lines in the country traveling in the same general direction, reaching from the extreme northern part of the southern peninsula of Michigan to Charlestown, W. Va.



THE E. H. MARTIN TELEPHONE COMPANY

MANY improvements are being made on the system of the E. H. Martin Telephone Company, of Webster City, Iowa. This company has a splendidly equipped plant in Webster City, a town with a population of only 6,500. It owns its own exchange building, and has installed one of the very latest central energy switchboards manufactured by the Kellogg Switchboard and Supply Company. The switchboard has an ultimate capacity of 2,000 lines, with 400 now in use. A second section of 400 lines is about to be installed. Over 300 farmers in territory contiguous to Webster City are connected with the exchange.

The company has recently completed the laying of over 1,500 feet of underground conduit in Webster City, and is now pulling in the cable. It has a construction gang building a No. 10 copper-metallic circuit from Fort Dodge, Ia., to Des Moines, a distance of 100 miles. Only Fort Dodge, Webster City and Des Moines will have connection with this line, as it is to be used exclusively for through business. The line is of the most up-to-date construction, 40 poles being set to the mile.

Besides this new line, the company owns and operates 500 miles of telegraph wires in connection with the Postal Telegraph-Cable Company, some being leased broker's wires, and in this way does a very remunerative business. Its toll lines, aggregating 1,500 miles, give service between small exchange centers and larger towns in twelve counties in Iowa. Several small exchanges besides the one at Webster City are also owned and operated by the company.

The company is capitalized at \$25,000. E. H. Martin is president, and M. M. Martin, secretary and treasurer. Mr. E. H. Martin has long been known as a progressive telephone engineer.

It is said that he is the original barb-wire fence telephone inventor, although there are several other aspirants in the field for this honor. He says that on a bet he ran a telephone line, using a barb-wire fence as the circuit, for a distance of fifty miles with four stations bridged on. The success of this experiment, he says, surprised even himself.

TELEPHONE SAVED HIS HOME

LORIN E. PRICE, of Butterfield's Ridge, O., one of the promoters of the Orange Township telephone line, which serves a number of farmers along the Ridge and has connections with Bowerstown, New Hagerstown and Leesville, would have been without a home recently had it not been for his telephone. And here's the story:

While Mr. Price was in Sherodsville one day his house took fire from the cook-stove chimney. There was no person at home except his mother and his wife. The latter, having great presence of mind, instead of trying to fight the fire, rang up all the subscribers along the line and notified New Hagerstown and Leesville of the situation. In a very short time many neighbors were at the scene of the fire, while citizens from New Hagerstown arrived seven minutes after the alarm was given, and seven minutes later a number arrived from Leesville.

The fire was quickly extinguished, although considerable damage was done. This should be a good advertising card for telephone companies working among farmers.

CROW'S NEST A METALLIC CIRCUIT

HERE is a peculiar telephone situation, the facts of which are taken from a newspaper in Burlington, Ky. A crow, according to the story, selected as a nesting place a point at the central office of the Calcutta (probably the British India Calcutta) Telephone Company, where four subscribers' wires entered. Its nest was built, so runs the story, of tin clippings and scraps of wire which it found around the exchange. One fine day a certain subscriber called up one of the four whose wires had been used by the crow for a nest foundation. The central operator rang the called party's bell, which, according to the story, caused all four of the subscribers' bells to ring, and brought them to the telephone. Whereupon the calling subscribers heard four simultaneous "Hellos!" and was much amazed thereat. The story says that the telephone employees were also amazed until they found that the crow's nest was a full metallic circuit.

KEYSTONE COMPANY HAS NOT COMBINED

C. E. WILSON, general manager of the Keystone Telephone Company, Philadelphia, emphatically denies that his company or the Keystone State Telephone and Telegraph Company, which is controlled by the Philadelphia company, have entered into a combination with any other company or companies.

"The Keystone Telephone Company or the Keystone State Telephone and Telegraph Company," says Mr. Wilson, writing to THE AMERICAN TELEPHONE JOURNAL, "have not merged with any other company, and at present have no intention of doing so. The Keystone State Telephone and Telegraph Company has about completed the toll exchange in Philadelphia and is building lines into Delaware to connect with the Maryland Telephone and Telegraph Company and north and west in the State of Pennsylvania. They are already giving service in part of New Jersey, and in the next sixty days will be able to give a very general long-distance service within fifty to seventy-five miles of the city. They will also be able to reach points in Northwestern and Western Pennsylvania as far as Scranton and Wilkesbarre, and south to Delaware and other points in Maryland."

The Keystone Telephone Company will soon have two new exchanges in operation. It has just ordered of the Kellogg Switchboard and Supply Company, Chicago, two common battery multiple relay switchboards of 4,800 lines capacity each. The contract also calls for a chief operator's desk, wire chief's desk and manager's desk, all of which will be of mahogany, to match the main switchboard. The Kellogg company will also furnish all power apparatus necessary, relay racks, distributing frames, lightning arresters and sneak current apparatus.

This will make a total ultimate equipment of 34,080 switchboard lines which the Keystone company will have, all furnished by the Kellogg Switchboard and Supply Company.

An important victory has just been won by the Keystone company over its Bell rival. This is in the decision of the governing committee of the Philadelphia Stock Exchange to recognize the Keystone as the official telephone as soon as its new exchange on Walnut street is completed.

Heretofore the Bell company has had an exchange on the floor of the Stock Exchange, and consequently reaped the benefit of the general telephones in the offices of the many brokers, as well as the private wires connected directly with their representatives on the floor of the exchange.

The greater portion of this work will now go to the Keystone company, and will mean the installation of many Keystone telephones in the offices of the bankers and brokers. This will be a hard blow to the Bell company.

SUIT FOR BELL LONG-DISTANCE SERVICE

THE State of Tennessee *ex relatione* the Memphis Telephone Company against the American Telegraph and Telephone Company, is the style of a bill in Chancery filed in Memphis recently.

In this bill the complainants seek by an alternative writ of mandamus to compel the defendant company to afford them the full and complete connections with its lines and wires for the transmission of messages over the same by its subscribers and patrons upon like terms and conditions and in form and manner as is afforded by the defendant company to the Cumberland Telephone and Telegraph Company.

The complainant alleges that it is a telephone company, and that as such it is engaged in running and operating a telephone plant in the city of Memphis, and that the defendant company is a corporation engaged in operating a long-distance telephone system connecting with New York and all the large cities. It is further asserted that the defendant does not own and operate a local telephone company, but that it is exclusively engaged in the business of furnishing telephonic connections between the cities of the United States.

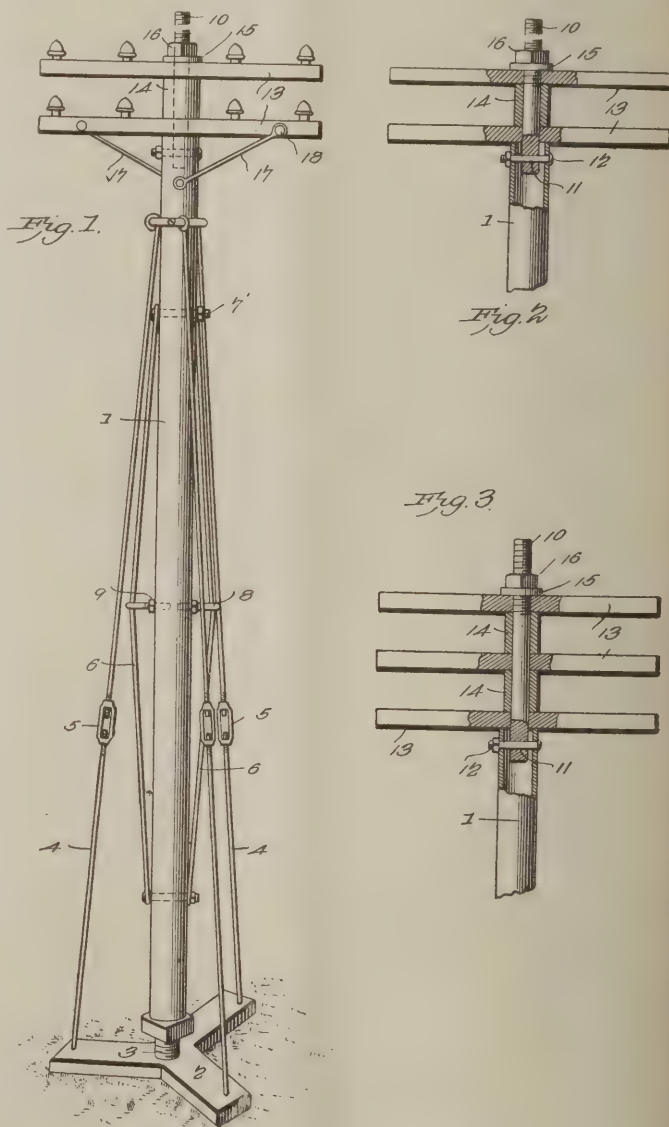
It is next stated that the Cumberland Telephone and Telegraph Company is also engaged in operating a local telephone com-

pany, and that the defendant allows it to use its connections and refuses them to the complainant, although it has offered to pay at the same rate as paid by the Cumberland Telephone Company.

Being advised that under the law the defendant has no such right to discriminate against it in the matter of this contract, the complainant files this bill.



Isaac M. Warner, of Union City, Michigan, patents (No. 708,277, September 2, 1902) and assigns to Frank C. Boise, of Union City a telephone or telegraph pole for which the inventor claims improvements in the construction of the pole and improved means for securing the cross-arms thereto. The drawings fully illustrate the device, which consists of a tubular iron or steel pole



mounted upon a base 2 and provided with stays and truss-rods having the usual turn-buckles. The top of the pole carries a vertical bolt 10, secured to the pole by the cross-bolt 12. The cross arms are carried by the bolt 10 and are secured by the washer and nut 15, 16. If several cross arms are used spacing blocks 14 are placed between them.



New Companies

LOS ANGELES, CAL.—The United States Long Distance Telephone and Telegraph Company has been incorporated with \$3,000,000 stock, of which \$70,000 has been subscribed. Its purpose is to cover Southern California with telephone and telegraph wires. It will run from Tia Juana to Bakersfield, from Los Angeles to Redlands and San Bernardino, from Los Angeles to San Bernardino, and from Los Angeles to San Luis Obispo. The estimated length of lines is 700 miles. In addition to this, the company proposes to do a general district messenger and burglar-alarm business. The headquarters of the company will be Los Angeles. The directors named in the articles of incorporation are C. A. Gates, A. F. Morlan, L. J. Maguire, J. B. Samuel and W. B. Brown.

DOVER, DEL.—The St. Louis and Memphis Long Distance Telephone Company has been chartered at Dover, to construct and operate lines between Memphis, Tenn.; Jonesborough, Ark.; Greenville, Greenwood and Holly Springs, Miss.; Jackson, Tenn.; St. Louis and Kansas City, Mo.; capital, \$1,000,000.

CARMI, ILL.—The White County Telephone Company, Carmi, has been incorporated with a capital stock of \$9,000, to operate a telephone system. Incorporators: J. C. Stokes, G. P. Hanna, T. H. Land.

CROPSEY, ILL.—The Cropsey Telephone Company, of Cropsey, has been incorporated to conduct a general telephone business; capital stock, \$2,500. Incorporators: C. E. Hayward, R. T. Slater, S. R. Williams, H. L. Barnes and E. W. Crum.

OTTAWA, ILL.—The Ottawa Home Telephone Company, of Ottawa, has been incorporated, to construct, maintain and operate telephone plants; capital stock, \$150,000. Incorporators: Roy C. Packard, Abram C. Godfrey and Andrew J. O'Connor.

HYMERA, IND.—The Hymera Telephone Company, of Hymera, has been incorporated, with a capital stock of \$5,000. Incorporators: James M. Bennett, Amos H. Coffee, Howard James, Joseph Asbury, John Franklin, Richard Dorothy and John G. Barnett. The company will operate a telephone line in the counties of Vigo, Sullivan, Clay and Greene.

MARION, IND.—Gas City and Jonesboro are to have a new Independent telephone company. Arrangements have been made for service between Marion, Gas City, Jonesboro and Upland. It is proposed to have the new plant ready for operation within ninety days.

MARION, IND.—The farmers of Fairmount Township have instructed Attorney Charles T. Parker to draw up articles of incorporation for a new rural telephone system which they will install in the near future. The promoters are among the representative men in the southern end of the county and are financially able to carry the project through to completion. They intend to have their lines strung all over Fairmount Township within a few months. County Commissioner John Kelsay is one of the leading spirits in the enterprise.

WEWOKA, I. T.—The Wewoka, Bearden, Burk City, Fentress and Oke-mah Telephone Company, of Wewoka, has been incorporated with a capital stock of \$2,500. Incorporators: C. L. Long, J. S. Bearden, W. E. Dixon, George C. Crump, C. P. Linn, the Jennings Company and W. H. Dill.

MITCHELLVILLE, IA.—Amended articles of incorporation of the Mitchellville Telephone Company have been filed in the office of the County Recorder. The company is capitalized at \$10,000. Its officers are: President, B. J. Carney; secretary, C. C. Keister; treasurer, S. J. Oldfield; directors, B. J. Carney, C. C. Keister, J. B. Uhl, B. R. Patterson and E. W. Clark.

WASHINGTON, IA.—The Mutual telephone line from Wellman to this town has organized a company for this town. S. W. Brookhart was elected president and Orin Mauck secretary. Several telephones were subscribed here in town.

ALMA, KAS.—It now seems practically assured that the telephone system projected for the Keene community, on Mission Creek, is to become an actual fact. A. F. Wade, of Keene, was in this city recently, and signed the contract with Mrs. McMahan whereby the Keene company gets the use of the Eskridge and Maple Hill exchanges in return for a payment of \$50 a year to her and the use of their lines as a toll line for her subscribers. G. A. Eberhardt is president of the new company, which is to be composed of the members of about six smaller companies. They have bought the Webb line from Keene to Dover, and the Knapp line to Maple Hill also becomes

part of the system. A line will be built across from another from up near Eskridge and another from about five miles west of Keene.

JOPLIN, MO.—The new stockholders in the Independent telephone company formed by what was known as the Mineral Belt Telephone Company have elected a board of directors as follows: George G. Bayne and W. H. Warren, of Joplin; John W. Layne, of Carthage; John Scovern and Theodore Gary, of Macon, Mo. The capital stock is \$200,000, and the company has been incorporated. It was also decided to change the name of the company to "Home" Telephone Company, and "Mineral Belt" will be dropped. Work of installing the new switchboard and other improvements are going steadily forward.

FLEMINGTON, N. J.—The local telephone company, which has connected many towns in this section of Hunterdon County, has been incorporated under the name of the Farmers and Merchants' Telephone and Telegraph Company of Hunterdon County. Franchises have been asked to enter many towns in Upper Hunterdon.

CHENANGO BRIDGE, N. Y.—The Chenango Valley Telephone Company has been incorporated, with a capital stock of \$7,000. It will construct lines from Binghamton to Norwich, by way of Chenango Bridge, Chenango Forks, Greene, Brisben and Oxford; from Binghamton to Cortland by way of Chenango Bridge, Castle Creek, Hydeville, Adams street, Whitney Point, Lisle, Killawog and Marathon; from Chenango Bridge to Sanitaria Springs, from Brisben to Coventry and from such of the places above named to other points in Broome, Chenango, Cortland, Delaware, Tioga and Tompkins counties. The directors are: Fred E. Allen, Whitney Point; Edwin H. Alderman, Castle Creek; Bradford W. Terry, Chenango Bridge; Charles Van Amburg, Port Crane; Charles H. Peters, Chenango Forks; Fred M. Harding, Chenango Bridge; William H. Slack, Castle Creek; William Edgerton, Coventry; William Beardsley, Harpursville; Ward Gifford, South Oxford; Charles J. Hayes, Hydeville; W. F. Van Cleve, Binghamton, and George H. Day, Brisben.

BURNS, ORE.—The Home Telegraph and Telephone Company, of Burns, has been incorporated, with a capital stock of \$10,000. Charles E. Kenyon, R. A. Miller and M. L. Lewis are the incorporators.

NEW WILMINGTON, PA.—A telephone company has been formed here, and the Borough Council has been asked to grant a franchise. The plan as outlined include only a local service, but it is also proposed to have lines to Neshannock Falls and Wilmington Junction if sufficient encouragement is given by people along the routes. Later service will be established with all other surrounding towns.

CLARKSVILLE, TENN. Application for a charter has been filed by the Home Telephone Company. The incorporators are W. G. Nagle, B. F. Gill, W. J. Manning, Wesley Drane and Dancy Fort. The company already has a franchise here, and expects either to buy a building or buy a lot and put up its own building.

SHERIDAN, WYO. The Rambler Telephone Company has been incorporated. It is capitalized at \$10,000, and will build a line from Laramie to the famous Rambler Mine.

Legal

WABASH, IND.—The Eel River Valley Telephone Company and the Warsaw Telephone Company, which have reached Wabash over the Home Telephone Company's line in this city, have been cut off by the last-named company. The Eel River Company built a rival plant at North Manchester at an outlay of \$20,000, and the old exchange owned by the North Manchester Telephone Company had a contract for the sole use of the Home company's system for toll messages. The Eel River company appealed to the courts, and the Home company for several weeks has received but has sent no Eel River messages. The North Manchester company complained, and to-day the Home company cut off the Eel River and Warsaw companies, the latter owned by Straus Brothers, Ligonier bankers. As the Bell company will have no relations with the Eel River, that line can handle no Wabash business, though it is doing the larger part of the service at North Manchester. An application for a mandamus to oblige the Home company to take the Eel River business will be made to-morrow. The fight is between Independent telephone companies, and is the first of its kind.

Rates

REDLANDS, CAL.—The Sunset Telephone Company has inaugurated the

THE WEEK'S MESSAGES *Continued*

new rate schedule, which makes material reductions in telephone charges. The old rate for office telephones was \$4.50 a month, for which the new rate is \$3.

WILMINGTON, DEL.—The Delaware and Atlantic Telegraph and Telephone Company, of this city, announced that it will increase its rate from \$42 to \$60 a year to business men. The Board of Trade will oppose the increase.

KANSAS CITY, MO.—The Council has passed an ordinance reducing the present telephone rates to \$60 a year for business houses and \$36 a year for residences. The present rate is \$96 to \$116 for business and \$42 for home telephones. Both houses of the Council passed the ordinance by unanimous vote.

RICHMOND, VA.—The Bell Telephone Company, after installing a new exchange and improving its service here, has sent out notices of an increase in its rates. It is claimed that by the terms of its franchise it has no legal right to take this action, and it will be contested.

Financial

VIRGINIA, ILL.—The Virginia and Little Indian Telephone Company has increased its capital stock from \$5,000 to \$25,000. Headquarters of the company have been changed from Little Indian to this place, and the name changed to Cass County Telephone Company.

INDIANAPOLIS, IND.—The New Long Distance Telephone Company has filed a mortgage for \$1,000,000 to the Union Trust Company of Indianapolis to secure payment on 1,200 gold-bearing 5 per cent bonds, payable in twenty years. The bonds, numbered from 1 to 800, are for \$1,000 each, and from 801 to 1,200, are for \$500 each. The mortgage covers all the tangible property of the company in the following counties: Bartholomew, Boone, Carroll, Cass, Clinton, Decatur, Delaware, Fayette, Fountain, Franklin, Grant, Hamilton, Hancock, Henry, Howard, Jackson, Jennings, Johnson, Madison, Marion, Montgomery, Morgan, Owen, Parke, Putnam, Rush, Shelby, Tippecanoe, Tipton, Wabash, Wayne and Vigo. The money will be used for the general improvement of the service. A. H. Nordyke says that the greater amount of funds will be used to purchase new copper wire for new circuits and additional lines over the leads already in use in various parts of the State. He said the company will expend about \$150,000 this year and probably about \$100,000 next year, as the service needs to be enlarged on account of the rapidly growing business. He said it may be some time before it will be necessary to use the amount of the loan, but the officers of the company deemed it advisable to secure the \$1,000,000 at one time rather than drag along making several mortgages to improve the system.

BOSTON, MASS.—The Mexican Telephone Company reports gross earnings for July of \$20,121, an increase of \$2,419, and net earnings of \$8,343, an increase of \$325. The gross earnings for five months increased \$11,615, and net, \$6,408.

BATAVIA, N. Y.—The Bell Telephone Company here has been assessed \$25,000.

BINGHAMTON, N. Y.—The Wayne County Telephone Company has mortgaged its plant and franchise to the Binghamton Trust Company for \$50,000, to secure a bond issue of equal amount.

HICKSVILLE, O.—The Hicksville Telephone Company has increased its capital stock from \$10,000 to \$25,000.

TOLEDO, O.—Several Cincinnati parties have been here negotiating for the purchase of Louisville Home Telephone Company bonds, which are held by local capitalists.

Franchises

OAKLAND, CAL.—At the next meeting of the City Council the bids for the telephone franchise will again come up for disposal. H. C. Stillwell, to whom was awarded the franchise for \$20,000, has refused "for legal reasons" to accept. The next highest bidder is W. C. Beasley, and he has already filed his bond for \$2,500 with the City Clerk.

SAN DIEGO, CAL.—The petition for a second telephone franchise in the city has been referred to the Council Committee on Telephones, which is making an investigation.

SANTA BARBARA, CAL.—C. H. Guthridge, of Los Angeles, representing the Home Telephone Company, has petitioned the City Council for a franchise to introduce the new telephone system into Santa Barbara.

FLORENCE, COLO.—W. H. Sweeney, of Pueblo, representing the Pueblo's Telephone Company, has asked for a franchise to maintain a telephone system in this city. If the franchise is granted the work on the system will commence in six months.

EVANSVILLE, ILL.—The Evansville City Council has passed an ordinance revoking the franchise of the Cumberland Telephone Company and ordering it to remove its poles and wires from the streets within ninety days.

STORM LAKE, IA.—The Northern Telephone Company has been granted a franchise here.

KANSAS CITY, KAS.—An ordinance has been submitted to the Fran-

chise Committee of the Kansas City Council granting Howard Jackson the privilege of placing a conduit telephone system in the city. The ordinance provides for a twenty-year franchise, and requires the system to be in operations within the next twenty-four months after the ordinance shall become a law. It provides that there must be at least ten metallic current long distance telephones established in the city. The rent for those located within two and one-half miles of the Chamber of Commerce, when used for business purposes, is not to exceed \$54 per annum; when used for residences, not to exceed \$36 per annum. In either case an additional charge of \$6 for each mile over two and one-half miles from the Chamber of Commerce is provided for. All injury to property in constructing the system is to be repaired at the expense of Howard Jackson, or, in case the lease is transferred, of his successors. Once each year the gross receipts of the company must be filed with the city clerk, in writing, and accompanied with a sworn statement to its correctness. Two per cent of the gross receipts thus testified to will then be deposited with the City Treasurer. The committee will perhaps report at the next regular meeting of the Council.

NATCHEZ, MISS.—The Cumberland Telephone Company has been granted a fifty-year franchise on condition that it does not raise the present rates, gives the city fifteen free telephones and installs a complete local cable service.

GLEN GARDNER, N. J.—The Township Committee has granted the Merchants and Farmers' Telegraph and Telephone Company the right to erect and maintain a line along the public roads of the township. It is proposed to establish communication with all the towns, and to induce farmers to connect.

CALEDONIA, N. Y.—The Inter Ocean Telephone Company, which is erecting a line from Buffalo to Albany, has been granted a franchise through the village.

LANCASTER, N. Y.—This village will soon be well supplied with telephone services if all companies that have applied for and obtained franchises string wires and put in a service. The Bell company has long been established here. Within a few weeks the Frontier Telephone Company, the Local Telephone Company, and, lastly, the Lancaster Company, have all obtained franchises from the Board of Trustees. The Local Company states in its application that it will connect with all other companies. The Lancaster Company is headed by Attorney H. B. Van Pyma, and wants to do a local business and make connections with other companies.

MINSTER, O.—The Minster Home Telephone Company has been granted a fifty-year franchise in the village of Minster. The Bell Telephone Company also wanted a franchise, but was refused. The company is composed of ten business men of this county, and has a capital stock of \$10,000.

OREGON CITY, ORE.—At a meeting of the City Council Attorney A. S. Dresser submitted an ordinance granting a franchise to the Oregon City and Suburban Railway Company to construct, maintain and operate a railway, telephone and telegraph line. This is the franchise asked for at the last meeting of the Council by C. D. Latourette, president of the company, who received from the Board of County Commissioners a right of way for his line from Oswego to Redland. The company is to pay annually for five years in advance, as a license fee, \$200. After January 1, 1914, the amount of license to be paid shall be fixed by the Council.

TURTLE CREEK, PA.—At a meeting of the Turtle Creek Council last night the Pittsburg and Allegheny Telephone Company was given a franchise. The company made several efforts to secure it, but was unsuccessful until the ordinance giving it a right of way became a law by burgess failing to sign or veto it.

MURFREESBORO, TENN.—At a meeting of the Board of Aldermen a franchise was granted to W. C. Frost and associates to erect telephone poles and wires over the streets of Murfreesboro. An ordinance was also passed that all telephone companies doing business in this town shall furnish any company connection with its out-of-town lines on tendering a reasonable compensation for the same. Mr. Frost represents a company with abundance of capital.

COLLIERSTOWN, VA.—The Rockbridge Telephone Company, with headquarters here, has been granted a franchise. A. Elhart is secretary and treasurer of the company.

Combinations

WAYCROSS, GA.—The Southern Telephone Company, of Waycross, and the Georgia Telephone Company, of Valdosta, have been purchased by the Southern Bell Telephone Company. New exchanges will be built at both Valdosta and Waycross.

OTTAWA, ILL.—The City Council, by resolution, has permitted the Northern Illinois Telephone Company to transfer its franchise to the Ottawa Home Telephone Company, and extended the time for completion of the same to April 1, 1903. The Home Telephone Company will have a number of Ottawans interested in it financially, although the bulk of the money for its equipment will be furnished by Eastern capitalists. R. C. Packard, vice-president and general manager of the Northern Construction Company, of Toledo, O., is here for the purpose of building the plant. The purchase is practically made of the N. I. T. franchise, which provides for a five-cent toll

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to any point in the county and a charge not exceeding 15 cents to Aurora, Joliet and cities of equal distance from Ottawa. A. C. Godfrey, who has been the local representative of the Northern Illinois, will remain as manager of the Home Telephone Company.

INDIANAPOLIS, IND.—S. P. Sheerin, of the New Long Distance Telephone system, with headquarters at Indianapolis, was at North Vernon recently, and closed the deal for the purchase and transfer of the local telephone plant in Vernon and North Vernon, 325 telephones, and the Jennings County Rural Telephone System, owned by Charles and Samuel Wright and others, to the New Long Distance Company. All lines will be changed at once to metallic circuits, and extensions will be made at once to both city and rural lines.

HAMBURG, N. Y.—The Hamburg Telephone Company has sold its stock to the Haines Telephone Company, and it is expected it will soon connect with the Frontier company of Buffalo.

TOPEKA, KAS.—All the telephone lines of Brown County have been purchased by the Northeast Kansas Telephone Company, which has a capital of \$120,000. F. M. Pearle and A. J. Hill, of Hiawatha, engineered the deal. The company has chartered.

WILKESBARRE, PA.—A syndicate made up of F. W. Larned and Thomas Dunn, of this city, and W. W. Watson and William Taylor, of Scranton, have purchased the Independent local telephone line at Auburn, N. Y. This company is using the Strowger automatic telephone, in which Wilkesbarre capital is interested, and has over 600 telephones. The plant will be enlarged and improved.

COLORADO, TEX.—The Colorado Telephone Company has purchased the Sweetwater exchange, together with 100 miles of line extending via Hylton to Ballinger. This company now owns the Colorado, Snyder and Sweetwater exchanges, together with lines extending from Abilene to Midland, Colorado to Snyder, Roby and Gail, and reaching a great many of the larger West Texas ranches.

Competition

ATTICA, N. Y.—Following closely upon the heels of an attempt by the Inter Ocean Telegraph and Telephone Company to buy up the Attica, Bennington and Cowlesville Telephone Company, and establish a local exchange in this village with outside connections with the numerous companies competing with the Bell Telephone Company, twenty absolutely free telephones are to be placed in homes and business places here by the Bell Telephone Company, under an arrangement that first-class instruments are to be put in and twenty citizens given free and unlimited use thereof for two months, at the end of which time the company will remove the telephones unless the persons using it requests it to be left, in which case he will be expected to pay regular rates thereafter. When the Inter Ocean Company is established here it is expected there will be a decided decrease in rates all around.

HAMBURG, N. Y.—Since the announcement that the Hamburg Telephone Company had been sold to the Haines Telephone Company, of Buffalo, the Bell Company has taken steps to make its service more efficient.

Underground

LANSING, MICH.—The Michigan Telephone Company is making active preparations for the installation of its new underground system here. As the fire alarm wires are strung on the same poles as the Michigan wires, City Council will have to make some provision for them, and it is probable they will also be put underground.

ST. PAUL, MINN.—All telephone, telegraph and electric wires in this city will be ordered put underground immediately.

ATLANTIC CITY, N. J.—Chief Engineer Isaac Wiesenthal will urge upon City Council when the annual appropriation ordinance is taken up, to make provision for placing the fire alarm wires in conduits underground. Superintendent Farrand, of the electrical department, has asked that Council appropriate at least \$10,000 for the work, which amount, he estimates, will place the wires of the Atlantic and Pacific avenues circuits where storms will not have an opportunity of placing them out of service. For \$15,000 the Boardwalk circuit can be treated in the same way.

BRIDGETON, N. J.—The Bell Telephone Company will ask to put some of its wires here in underground conduits.

BRIDGETON, N. J.—The Interstate Telephone Company will soon begin the work of putting its wires in Bridgeton in underground conduits.

RAHWAY, N. J.—The Inter-State Telephone Company has asked to lay underground conduits for its wires in this city.

LANCASTER, PA.—The Pennsylvania Telephone Company will be required to put many of its wires here underground.

Elections

DUBUQUE, IA.—The Interstate Telephone Company has held its annual election, at which the following directors were elected: J. Denkhoff, J. M. Dunn and Frank Irish. The directors then elected the following officers: President, Vic. H. Stevens; vice-president, R. W. Sodsdon; secretary and treasurer, C. M. Laxson. At a meeting of the directors it was decided to

pay dividends from the net earnings, as follows: On stock issued prior to May 1, 10 per cent. On stock issued from May 1 to September 1, 5 per cent. The dividends to be paid January 1, 1903. As a 5 per cent. dividend was paid to the stockholders out of net earnings from September 1 to January 1, 1902, those who had stock prior to January 1 will have received 15 per cent for the year. A large amount of constructing has been done, and those lines which were in operation have had to make the earnings for the whole investment.

LIVERMORE, IA.—The stockholders of the new telephone line held a business meeting in Livermore and elected H. S. Buell, president; Leon Hack, secretary; T. O. Hanson, of Bode, vice-president, and J. L. Clave, of Ottosen, treasurer. The system was named the Rural Union Telephone Company.

MANTUA, O.—The Mantua Home Telephone Company held its annual meeting of stockholders here. The following directors were elected: L. A. Cook, A. E. Frost, Ira E. Hine, F. C. Price and E. S. Hannum. The following officers were elected: L. A. Cook, president; A. E. Frost, vice-president; Ira E. Hine, secretary; L. B. Cook, treasurer. The company has a gang of men at work on new lines.

ABERDEEN, S. D.—The annual meeting of the stockholders of the Dakota Central telephone lines was held here recently. The old officers and directors were re-elected. The annual report shows that during the past year \$120,000 has been expended in extensions, improvements and general equipments. One thousand miles of new lines have been constructed and seven exchanges bought, including the Aberdeen exchange. Several important improvements are now contemplated, especially in the way of constructing copper metallic circuits on the more important lines of the company.

Construction

EUFALA, ALA.—The wire for the new telephone system to Blue Springs has arrived, and the work of putting it up has extended a mile or two out of the city.

TALLADEGA, ALA.—The Southern Bell Telephone Company will spend \$30,000 in Talladega and in the country traversed in connecting the city with the long distance lines.

WALSENBURG, COLO.—The new telephone line from Alamosa and Walsenburg has been located, and the poles are all up between Walsenburg and the top of Veta Pass. The closing of this gap will be of importance to this part of the country inasmuch as it will give direct telephone connection with the county seat at San Luis.

AUGUSTA, GA.—The Strowger Telephone Company has made a number of additional long distance connections, including connections with Blythe, Keysville, Mathews, Stellville, Wrens, Louisville, Bartow, Wadley, Davidsboro, Spread, Avera, Gibson, Mitchell, Grange, Agricola, Chalker, Warthen, Sandersville and Tennille. The company is making other long distance arrangements, and further important announcements in regard to this branch of the service will be made in a short time.

CARROLLTON, GA.—The Gainesboro (long distance) Telephone Company, with headquarters here, is continuing the extension of its service over this and adjoining counties. A force of construction hands is building from Centralhatchie to Franklin, in Heard County. This will be a most serviceable link, inasmuch as all parts of this county can reach Franklin, the county seat of Heard, which has no wire to the place nor any railroad in the county. Another force of hands is near Cedartown erecting wires and posts for the company on a link of eighteen miles from Buchanan to Cedartown via Felton, Dug Down and Youngs.

BURLINGTON, ILL.—The farmers west of here intend to build an Independent telephone line to their respective properties and connect with the Burlington system.

COOKSVILLE, ILL.—The Cooksville Telephone Company will build a new office soon.

ELEANOR, ILL.—A farmer's telephone line is to be constructed east of this town.

FOREST CITY, ILL.—The Forest City Telephone Company is placing its poles in Delavan preparatory to running a line to Delavan, Pekin and Peoria.

KEITHSBURG, ILL.—The telephone company is making extensive improvements to its system. Larger poles and new cross-arms are taking the places of the old ones, and several miles of new wire are being strung, also many other improvements are going on.

SALISBURY, ILL.—A telephone system will be constructed here soon.

ELWOOD, IND.—The Madison and Delaware Counties Telephone Company has about completed its system in Elwood. The plant at Terre Haute will not be ready for service before January 1, it is thought. The building at the latter place is now nearing completion, and will soon be ready for the introduction of the new switchboard. Connections will then be made and the telephones installed.

MUNCIE, IND.—The telephone instruments received by the Delaware and Madison Counties Telephone Company two months ago for use in Muncie will probably be installed this month. The company now has a large force

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of men at work in the southern part of the city stringing wires. Nearly all the poles have been set, and the cross-arms are nearly all in position. The company expects to begin operations some time between October 15 and November 1.

PORTLAND, IND.—The Home Telephone Company is expending \$1,200 in the improvement of its local system.

BURLINGTON, IA.—The American Telephone and Telegraph Company has commenced work on a new telephone line between Burlington and Peoria.

COON RAPIDS, IA.—The Harris-Jewell Telephone Company has received the poles for the telephone system, and has since been busy putting on cross-arms. The work of setting the poles will soon begin, and soon afterward the stringing of the wire. An order has also been placed for a number of the latest improved telephones.

PROTIVIN, IA.—The Protivin Telephone Company this spring and summer has built direct lines to Calmar via Spillville, to Fort Atkinson, to Waucoma via Jackson Junction, to Lawler, and is constructing one to Ridgeway.

RENWICK, IA.—The local telephone exchange is completed in Renwick and the gang is now working on the line between here and Hardy.

BAXTER SPRINGS, KAS.—The Baxter Telephone Company, recently incorporated with a capital stock of \$10,000, will construct 25 or 30 miles of toll line and several rural lines in the near future. Jno. M. Cooper is president and treasurer of the company, and E. W. Dow, vice-president and general manager.

EMPORIA, KAS.—Ex-Postmaster W. F. Ewing has begun work as general manager of the Emporia Telephone Company, which position Howard Dunlap, president of the Emporia Savings Bank, formerly held. The telephone exchange has grown too large for Mr. Dunlap to manage, together with his banking business. The telephone plant will be reconstructed and its capacity increased.

HUTCHINSON, KAS.—The Missouri and Kansas Telephone Company is putting in a new 100-line switchboard. The cable recently received by the company is rapidly being put in place, also.

OTTAWA, KAS.—The Ottawa Telephone Company has commenced setting poles for its telephone line from Ottawa to Garnett. It is the intention of the company to build from Garnett south with all speed possible, connecting Garnett with Iola and Fort Scott.

WHITE CLOUD, KAS.—Manager Munsel, of the Northeastern Kansas Telephone Company, has been here making arrangements to give telephone service. While here he closed a contract with John Lynds for connection with his line over the river. A carload of poles has arrived. The new line will connect with the main line at Asbury Church. Many farmers along the line will be served. Additional names have been secured to the old list, which was circulated several months since, which insures the inauguration of a central office for White Cloud. The location has not been definitely determined. The cost for business houses is \$1.50 a month and \$1 for residences in town. Farmers are charged \$15 for connection along the main line, after which they pay \$1 a month.

PADUCAH, KY.—The People's Telephone Company has let the contracts for its new exchange building, and work has been commenced. It will cost \$7,000.

PARIS, KY.—The Bourbon Home Telephone Company has located in its exchange building, and is pushing work on its lines in this city and county. The company has been greatly delayed by slow shipments of necessary material. The completed system will be one of the best in the Central West. The latest devices in telephone equipment will be used.

SEBREE, KY.—The Sebree Independent Telephone Company is putting in a new switchboard.

FAYETTE, ME.—The Crosby Telephone Company is building a system in this place.

JEFFERSON, ME.—A sufficient amount of stock has been subscribed by citizens of Jefferson to ensure the building of a telephone line from East Jefferson to Waldoboro, and work on the line will be begun at once.

PITTSFIELD, MASS.—The Berkshire Telephone Company has filed an acceptance of its franchise in this city, and the preliminary work of establishing its system has been commenced. The work consists of the mapping out of the city and the securing of pole locations outside the district where the conduits will be installed.

BALTIMORE, MD.—The Maryland Telephone Company is making many improvements to its city and suburban systems. New lines are being constructed, additional cables laid, switchboard additions amounting to about \$50,000, and many others.

CRISFIELD, MD.—The Diamond State Telephone Company has a large force erecting new poles upon the streets of Crisfield. The new system will be in working order throughout Somerset County in about four weeks. Harry Mayer is manager and McGee Riffin local manager.

EASTON, MD.—A large force of men has been in this section for some time repairing the Diamond State Telephone Company's lines.

PEWAMO, MICH.—The Union Telephone Company is constructing a telephone line from Pewamo to Matherton and Hubbardston.

MANKATO, MINN.—Work on the newly organized Minnesota Valley long distance telephone company's line between this city and Minneapolis has been begun at the Minneapolis end of the line. The poles and other material have arrived for the Mankato Citizens Telephone Company's new farmers' line to Nicollet Station and Judson. Work will be pushed on this line. The new switchboard for the company's new building has arrived and is being set up. A vast amount of work remains to be done, and it will be six weeks at least before the new board can be put into operation.

VICKSBURG, MISS.—The Cumberland Telephone and Telegraph Company is making many improvements to its service here and in the vicinity.

KNOBNOSTER, MO.—The Twentieth Century Telephone Company, with exchanges at Warrensburg and Windsor, has opened an exchange at Knobnoster. The company is also preparing to erect several farmers' lines.

SAVANNAH, MO.—The Gravelwall Telephone Company has set its poles into town, and will stretch the wire immediately. This makes another line to be added to the Mutual switchboard.

PLAINFIELD, N. J.—The New York and New Jersey Telephone Company is making improvements in its system about the city and vicinity.

SUSSEX, N. J.—It is said that the New Farmers' Telephone Company will extend its lines from Sussex Borough as a center to Newton, Hamburg, Franklin Furnace and Ogdensburg.

ALBION, N. Y.—The Home Telephone Company is extending its lines, and now has connection between Tonawanda and Medina, and also between Medina and Batavia. Still further extension so as to take in Rochester and Cleveland will soon be made.

CASTLE CREEK, N. Y.—The telephone line between here and Whitney Point will soon be in working order. The wires are already stretched most of the way.

CORTLAND, N. Y.—Work on the new Tioughnioga Telephone Company's line to Ithaca is progressing rapidly. One line has been strung as far as Dryden and the poles have been set beyond that village. The company hopes to have the line completed within one month. The company, which is made up entirely of local capitalists, has also secured right of way for a line to Binghamton, and expects to begin the construction of the line to that city within a month, and will have it completed and ready for operation before winter. The Home Telephone Company has completed its line to McGrawville, and several telephones in that village are already connected and many more will be installed within a week. This line will be free to subscribers both in this city and McGrawville.

EAST BRANCH, N. Y.—Owing to the East Branch telephone line being overcrowded between Andes and Downsville, a second wire will be strung from Pepacton to Downsville, and a number of telephones will be connected with this wire.

EDMESTON, N. Y.—The Wharton Valley Telephone Company is about to install an up-to-date local exchange here.

FRIENDSHIP, N. Y.—The switchboard for the new Independent telephone exchange here has been received, and work on its installation is in progress.

GENEVA, N. Y.—The Geneva Telephone Company will not restore the automatic system here, but will proceed at once to install a central energy switchboard. The old wires will be taken down and new cables substituted.

LYNDONVILLE, N. Y.—The Orleans County Rural Telephone Company is progressing favorably in its work of connecting rural sections of this county with telephone service. Thus far the company has erected poles and established its line throughout Lyndonville and as far as Yates, from which place it intends to extend to Kuckville and Waterport.

CLINTON, N. C.—A telephone line is being built from Clinton to Kenansville via Warsaw. It will be known as the Duplin Telephone Company. It will connect Clinton with the Clinton-Dunn Telephone Company, which has a local exchange and a line to Dunn.

DURHAM, N. C.—Permission has been granted the Erwin Cotton Mills Company to put up telephone poles on any road leading southward from Durham. It is the purpose of the company to extend its private telephone line to its new mill at Smiley's Falls, in Harnett County.

WILMINGTON, N. C.—The force of the Columbus Telephone Company, which is building the line between Wilmington and Southport, has already put up five miles of poles.

CANDO, N. D.—The telephone line which is to connect Devils Lake and Minot has been completed from Church's Ferry to this city. The line, which in time will become a part of a long distance system, will also connect with the local system.

EAST GREENVILLE, PA.—The Delaware and Atlantic Telegraph and Telephone Company is rapidly building its line from Quakertown to this place. The poles in Pennsburg have been erected, and the line in this borough will be built next week.

GETTYSBURG, PA.—The telephone line from here to York Springs will soon be much improved.

HONESDALE, PA.—The Citizens' Telephone Company contemplates re-

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building the entire plant here, making numerous improvements. The central office will then be established in a new location, not yet decided upon.

NORTH WALES, PA.—The Montgomery Telephone Company is stringing the wires about town, and will soon have the line working to Centre Point.

ORWIGSBURG, PA.—The United Telephone Company will open an exchange in this place. The work of placing in a switchboard is now in progress.

PITTSBURG, PA.—The Pennsylvania Railway Lines West of Pittsburgh have authorized the building of a private telephone exchange in Grand Rapids between South Yards and Mill Creek. All together there will be about seven miles of wires. The system for Grand Rapids will be modeled after the one in use in the Allegheny yards and shops. It is said that the Lines West will install such systems in other Western cities that are now without them.

PITTSSTON, PA.—The Tunkhannock and Wyoming Valley Telephone Company, which is to build a line from Pittston to Tunkhannock, is now making a canvass for subscribers at Wyoming's county seat. The line is already connected up as far north as Centremoreland, and will pass through the summer resort at Lake Winola. The new company will operate in connection with the Independent systems at Wilkesbarre and Scranton.

HURLEY, S. D.—A large force of men is at work on the rural telephone line now in course of construction between this place and Parker.

BEEVILLE, TEX.—The Rural Telephone Line, of which E. J. Atchley is manager, is extending its line to Refugio. A line is also being run to the Beeville Irrigated Gardens and to the Experimental Station. The line now has about 80 subscribers.

DIXIE, TENN.—The Dixie Telephone Company is completing its line from Camden by way of Vale to Mixie.

NASHVILLE, TENN.—The Cumberland Telephone and Telegraph Company is constructing a line from Chicago, Ill., to Nashville, where the general offices of the company are located.

WHITNEY, TEX.—The Independent Telephone Company, of Waco, is constructing a long distance line to this place. It will connect with the local exchange.

RANDOLPH, VT.—The Co-Operative Telephone Company's line is being extended rapidly in this part of the county as well as in the eastern part. The line is up from East Randolph north to Williamstown Gulf, and from East Brookfield to Brookfield, thence half way to Williamstown. It will be extended to Williamstown from East Brookfield and Brookfield, and then north to Barre and Montpelier. Poles have been set from North Randolph toward Randolph Center. Poles are up from East Randolph to Royalton and the wire will be strung immediately. Connection will be made at South Royalton with the line of this company that goes from Chelsea to that village. Wire is also being strung from Chelsea to East Randolph, and several other lines that are being worked up will be strung in the near future.

GRAHAM, VA.—The Graham Telephone Company is building a line to Stowersville, which will connect with the Clear Fork Company's lines.

PALMYRA, VA.—The Fluvanna and James River Valley Telephone Company, with headquarters at Palmyra, is planning for extensive improvements, some of which are already under way. They include a long distance line from its central office, at Wilmington, Va., to Richmond, Va., and an extension of its lines from Haden'sville to Elk Hill, in Goochland County, and from White Hill, via Buckingham Courthouse, to Wiggins, Va. These improvements will call for an outlay of about \$10,000. The company now has about 155 miles of lines, has established connection with the Albemarle Telephone Company and the Louisa Telephone Company, and has made a contract for connection with the Richmond Telephone Company. With the present plans completed the company will have a fine long distance line connecting Richmond, Lynchburg, Farmville and Petersburg, all of these places having good Independent companies. The county lines will tap this long distance line at their various centrals, thus giving them connection with the above named places. The line at present occupies a part of the following counties: Fluvanna, Buckingham, Nelson, Powhatan, Cumberland, Goochland and Chesterfield, and construction will soon begin through Appomattox to Lynchburg. Work is well under way on the line to Richmond, all of the materials having been purchased, and the work of construction has advanced towards Richmond as far as Midlothian in Chesterfield County. The company is entirely out of debt, and during the two years of its existence has paid a handsome dividend to its stockholders.

GLENWOOD, WIS.—Work on the extension of the Glenwood telephone system to Emerald, Ceylon and New Richmond, is now under way. Later in the fall the system will be extended eastward to Downing and Boyceville, and in the spring north to the kaolin mines and Graytown, and south to Wilson and Hersey. Service on the local system has been begun, about fifty patrons in Glenwood being served.

Miscellaneous

JACKSONVILLE, FLA.—The Southern Bell Telephone Company has

completed five new long distance lines out of Jacksonville, by which connection may be had with nearly every city in the country.

FORT MYERS, GA.—The Lee County Telephone Company has opened its new line to Labelle, the easternmost village on the Caloosahatchee River. Practically all prominent points on the Caloosahatchee River are now connected with Fort Myers by telephone.

SHOSHONE, IDAHO.—The telephone line between Shoshone and Hagerman has been completed by Messrs. Coltharp and Baugh.

MORRIS, ILL.—Chas. B. Cheadle, of Joliet, director of the Interstate Telephone Company, recently incorporated under the laws of New Jersey, is here looking over the telephone field with a view, it is thought, of extending the lines to this city. The company already has lines in Joliet, Aurora, Streator, Wilmington, and will soon be in Coal City and other points in Grundy County.

EVANSVILLE, IND.—An effort will be made to induce neighboring towns to take stock in the Municipal Telephone Company. Several thousand dollars is expected to be realized in this way. Mayor Covert has received a letter from an influential citizen of Huntingburg, saying citizens of that place had subscribed \$2,000 to the company, and they would double the amount if necessary. Stock blanks will be sent to all the towns in the neighborhood having Independent Telephones, and Mayor Covert thinks they will all take at least \$2,000 worth of stock each. About \$60,000 of the \$190,000 necessary to equip the company has been subscribed. Neighboring towns having Independent telephones are at the present time unable to get connection with Evansville. They are all anxious to have long distance connection, and they know that it will not be possible to do so until there is an Independent telephone company in the city.

GOSHEN, IND.—The Farmers' Mutual Telephone Company, of Clinton township, is again negotiating with the Home Telephone Company of Elkhart County for service into Goshen and to other points reached by the Home company's lines. Dissatisfaction over the toll between Millersburg and Goshen some time ago, caused the Home company to cut out the Mutual line. To obtain service into Goshen the Clinton township farmers' company entered into a temporary agreement with the Central Union Telephone Company, which was terminated when the Bell people found they could not secure a permanent contract. Work on the proposed toll line has not been begun, and it is quite probable that the line will not be built. The projectors have foreseen the disadvantage of constructing a line into Goshen without an exchange. Representatives of the company have approached members of the council to ascertain whether that body would be likely to grant the Mutual Company a franchise to operate an exchange and complete telephone system in Goshen. They met with no encouragement with a plan that would mean a third telephone exchange in this city. Hence the Mutual people are now negotiating to again secure connection with the Home Company. There are about 150 Mutual subscribers. Nearly half of this number are willing to have their line connected with the Home Company's service. The Home Company has offered a rate of 25 cents per month each to the Mutual Company's patrons, and the rate will no doubt be accepted, for it provides for free service to Goshen, Elkhart, Middlebury and New Paris. When the Mutual Company was organized it had about ten subscribers, who secured a contract for service into Goshen for ten years for \$150. The company in the meantime has been enlarged to fifteen times its original size. Several meetings have been held by representatives of both companies. It is anticipated that the Mutual will soon accept the 25-cent rate. The Independent companies at Dunlaps and New Paris are paying 25 cents a month.

SOUTH RAUB, IND.—The switchboard for the South Raub Co-operative Telephone Company is completed, and will be ready for use soon.

DES MOINES, IA.—George N. Bandy, manager of the Mutual Telephone Company, says his company will spend \$20,000 putting in new cables for a full metallic system this fall, provided the city will cancel the 5 per cent. tax against the company. The city would do this, but the Mutual Company owes a small sum of money to the city, which it says cannot immediately be paid, and the city will not cancel until the debt is paid.

VINTON, IA.—The Farmers' Mutual Telephone Company has begun operation at its central office in Vinton, with ten farmers' lines in connection, these lines carrying about 140 telephones. They have direct connection with Shellsburg and Garrison, and by way of Shellsburg connected with Urbana, Brandon, Mt. Auburn, Atkins, and Palo, and from Urbana connect with Center Point, Troy Mills, Walker and Central City. They expect to have connections soon with La Porte and Dysart.

WASHTA, IA.—The rural telephone line has been completed, and is proving a great convenience to farmers who have put in telephones. The line connects Washta and Quimby.

WICHITA, KAS.—The Wichita Telephone Company is nearly ready to give service to its patrons. It has 1,100 subscribers, and all the subscribers' instruments have been installed.

EASTON, MD.—Easton and Baltimore are now connected by a long distance telephone line.

BOSTON, MASS.—The American Telephone and Telegraph Company's

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statement of output of instruments for month ended August 20, and the fiscal year to date, with comparisons, follows:

	1902.	1901.	Increase.
Gross output.....	84,279	81,144	3,135
Returned	43,034	42,997	37
Net output.....	41,245	38,147	3,098
From December 21 to August 20—			
Gross output.....	733,323	607,593	125,730
Returned	303,355	267,807	35,543
Net output.....	429,968	339,786	90,182
Total outstanding August 20....	2,955,574	2,567,856	387,718

HARTWICK, N. Y.—The Milford Long Distance Telephone Company is raising stock for putting in a line at this place. This stock is guaranteed, and is now paying 6 per cent.

MANCHESTER, N. Y.—C. P. Osgood, proprietor of the Independent Telephone System here, has been made a proposition by farmers, living between Palmyra and Marion, to extend a line so as to give them connection with the local exchange.

COLUMBUS, O.—The Panhandle Railway contemplates putting in an exchange and a telephone system for its private use here.

NEW FRANKLIN, PA.—The matter of a local telephone company to be owned and operated by the citizens along the line, is being discussed and investigated by the grange here.

WESTCHESTER, PA.—Chester County has several private telephone lines, and the suggestion has been made that the farmers should organize in districts where there are no trunk lines and establish private lines which will do the work for them, while they wait for the trunk lines to be built. It is but a question of time when all the progressive farmers in Chester County will have telephones in their homes, and by putting up their own lines, they will be a few years ahead of the public companies in some districts.

FAIRVIEW, UTAH.—The Rocky Mountain Bell Telephone Company has announced positively that its contemplated line from Fairview over the mountains to Scofield has been abandoned.

ST. ALBANS, VT.—The Franklin County Telephone Company has just completed a toll line from St. Albans to Swanton. Eight public pay stations have been installed in convenient places about the village of Swanton, and a toll rate of five cents per message established between St. Albans and any of the pay stations. The toll rate between Swanton, and Fairfield, or Georgia, is but ten cents. These rates are about one-third those formerly charged by any other company.

DANVILLE, VA.—The Southern Bell Telephone Company is looking over the territory, and will possibly construct a long distance line connecting this city with Martinsville and South Boston.

DULUTH, WIS.—The new switchboard of the Zenith Telephone Company in Duluth, has been put into operation. Since the fire last spring the company has been working with a temporary board, and was greatly discommoded.

Personal

CANTON, ILL.—Messrs. Frank L. and Fred G. Bills, of the Canton Home Telephone Company, are in the city on business connected with the installation of the new exchange.

HENDERSON, KY.—T. L. Nolin, manager of the Henderson Telephone and Telegraph Company, will leave shortly for Louisiana, Mo., to give attention to business interests there. Mr. Nolin will be succeeded by J. W. Walker, who has returned improved in health. Mr. Walker was formerly manager here, and was very popular.

BALTIMORE, MD.—Osborne I. Yellott, of Towson, has been appointed local counsel for the Maryland Telephone and Telegraph Company.

GRAND RAPIDS, MICH.—Four members of the city council of Hamilton, Ont., are in Grand Rapids for the purpose of looking over the local telephone system. The members of the party are Aldermen Donville, Burholder, Nicholson and Kerr. Hamilton is a city of 55,000, and has the question of adequate telephone service to meet. They will inspect several other systems before returning to Canada.

EATON, O.—Arthur C. Gray, recently employed as superintendent of the Eaton Telephone Company, has tendered his resignation. It has been accepted by the directors of the company, and he will go to Vincennes, Ind., where he has accepted a similar position with a telephone company.

OBITUARY NOTICES

Col. R. M. Wallace, of Sumter, S. C., president of the Sumter Telephone Manufacturing Company, died at his home Thursday, September 11, after an illness of two weeks.

Thomas W. Numan, Portsmouth, O., local manager of the Home Telephone Company, died in that city recently.

TRADE NOTES

G. M. GEST, the conduit contractor, has secured the contract for the conduit system for the Schenectady Railway Company, Schenectady, N. Y. This work, which will amount to over 200,000 feet, will be a model installation, and many new features have been designed for this particular system. The conduit for this work will be furnished by the H. B. Camp Company, N. Y.

Mr. C. P. PLATT, of the sales department of the Kellogg Switchboard and Supply Company, Chicago, is confined to his house with typhoid fever. His many friends hope for a rapid recovery.

PLANTS FOR SALE

FOR SALE—One of best equipped telephone exchanges in Kansas; price, \$22,000; upon which amount plant now NETS 23 per cent. If you mean business, address X for particulars, care of AMERICAN TELEPHONE JOURNAL, New York.

FOR SALE.—Whole or part interest in Telephone Exchange. Present yield, 20 per cent; additional installations, 25 per cent. Entire plant, \$4,200. Excellent territory. Address W. HOWARD MEARS, Kasson, Minn.

TELEPHONE PLANT FOR SALE—160 telephones, 100 miles of toll lines; excellent opportunity for extending business; will sell for \$12,000; pays 15 per cent. net on this amount. Address TELEPHONE CO., care of AMERICAN TELEPHONE JOURNAL.

WANTED

EXPERIENCED telephone traveling salesman; acquaintance with Northwest trade preferred, but not essential. Address THE VOUGHT-BERGER COMPANY, makers of telephones and switchboards, La Crosse, Wisconsin.

POSITION by a competent and experienced salesman of electric light, telephone and street railway material, by a young man with 14 years' experience in this business; best of references. Address L. C., care AMERICAN TELEPHONE JOURNAL.

POSITION as manager or superintendent of small exchange; at present in charge of small exchange; 31 years old; married; strictly temperate; references furnished. Address A. B. C., care AMERICAN TELEPHONE JOURNAL.

POSITION as Superintendent or Manager in Telephone System, either on line or in exchange, by a young man of strictly temperate habits. Best of references as to character and ability. Address BOX 21, Oneida, Ill.

POSITION in exchange of from 150 to 500 subscribers, as manager or assistant manager. Experience in construction and switchboard work; best of references. Address JAMES C. THURSTON, North Vernon, Ind.

WANTED.—Position as manager of exchange of 100 or 200 subscribers; or as inspector or traveling salesman for supply house. Eight years' experience; best of references furnished. Address G., Box 125, Monroe, Ga.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISSELL CO., Toledo, Ohio.

WANTED.—A good transfer boy to take care of 125 city and 130 country telephones. State lowest wages and experience. Address VIRGIL A. GEIGER, Churubusco, Ind.

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UNDERGROUND VERSUS AERIAL CONSTRUCTION

FROM THE COMMERCIAL STANDPOINT

By ARTHUR VAUGHAN ABBOTT, C. E.

WHEN shall the wire plant be placed underground?
Where shall aerial lines be used?

These are grave questions of equal importance to the growing exchange or to one about to be installed, and must be viewed both from the technical standpoint and also from that of the most desirable business policy. In the congested portions of larger cities there is, perhaps fortunately, no choice, for by universal municipal ordinances, underground lines are obligatory; but in most towns of less than 25,000 inhabitants, and in the outskirts of larger cities, it lies chiefly within the power of the telephone company to decide upon the type of construction to be installed. For consideration this question may be divided into three heads:

First. Initial investment. Will an underground plant cost more or less than an aerial plant?

Second. Which plant will cost the least to operate, including therein the necessary annual expense chargeable to maintenance and depreciation?

Third. Which plant will afford the best service?

FIRST—INVESTMENT.

To place telephone circuits underground requires the construction of a conduit, and the introduction of cables. The cost of conduit construction consists partly in the expense of opening and closing the street (including the replacement of pavement), with the cost of building the necessary manholes; and partly in the placing of the ducts. Evidently the cost of street work and manholes is, within reasonable limits, entirely separate from, and independent of the cost of the ducts. The expense in ducts will depend only upon the cost of duct material and the number of ducts installed. For this reason conduits having but few ducts are much more expensive per duct foot than

those having many, and it is evidently wise to build at the outset as large a subway as future facilities will require. Otherwise the street must be re-opened, and that portion of the conduit expense which is independent of the ducts be reexpended, thus making underground construction exceedingly expensive. On the other hand, the installation at the outset of as large a subway as may be required for a decade in the future, inflicts,

particularly upon a young company, an initial expense that may be severely burdensome.

The best present practice in conduit building involves the use of vitrified clay ducts, with manholes constructed either of brick or concrete. The cost of manholes 5 feet by 7 feet on plan, and, say, 5 feet in height under the roof, will be about \$75 for brick manholes and \$50 for concrete. Vitrified clay ducts may be obtained in two forms, single ducts and multiple ducts. Though the expense will vary with the kind of paving encountered and with local prices of labor and material, the average cost of installing vitrified clay ducts will be found about as shown in Table I.

According to the good old conference specifications, telephone cable is manufactured of No. 19 wire, having 120 pairs per cable. At present there is a strong tendency to increase the number of pairs in the cable and, to decrease the size of the wire, for experience has shown that cables of No. 22, and possibly

of No. 24 wire, containing 400 pairs, or possibly 600 pairs, will come into use in the future. No. 22 wire for all short lines will give satisfactory transmission. Increasing the number of pairs per cable and decreasing the size of the wire will evidently reduce the cost of the wire plant.



SHOWING ONE METHOD OF LAYING 36 DUCTS IN SHALLOW TRENCH.

Table 2 shows the approximate cost per pair-mile of cables of different sizes, built of No. 22 wire.

From the nature of the business it is impossible to utilize all the ducts constructed throughout their entire length, or all of the cable wire. There must always be room for growth. Subscribers are constantly moving about, and even with the best planning, some unused wire plant will always exist. To-day, probably not

described for underground lines. The lower horizontal scale, reading from right to left, is headed "Number of pairs of open wire," and applies to these five curves, which are respectively entitled 60 ft. poles, 50 ft. poles, etc. Thus to ascertain the cost of open wire upon a 50 ft. pole line, carrying 20 circuits find 20 on the lower scale and follow a vertical line to its intersection with the curve for 50 ft. poles; and thence a horizontal line to the left hand scale, finding \$80 as the cost per circuit mile. Unquestionably the expense of open wire will vary very greatly with

Number of ducts.	Cost per conduit foot.	Cost per duct foot.
4	\$1.60	\$0.40
6	1.90	.32
8	2.00	.25
10	2.30	.23
12	2.40	.20
14	2.55	.18
16	2.75	.17

over half of the actual ducts installed contain working cables, and it is doubtful if 65 per cent. of all cable wires are alive, so that in the calculation of the cost of underground wire plant, a corresponding allowance must be made for spare plant.

In Fig. A a set of curves is given showing the cost of underground wire plant per pair-mile, using a varying number of

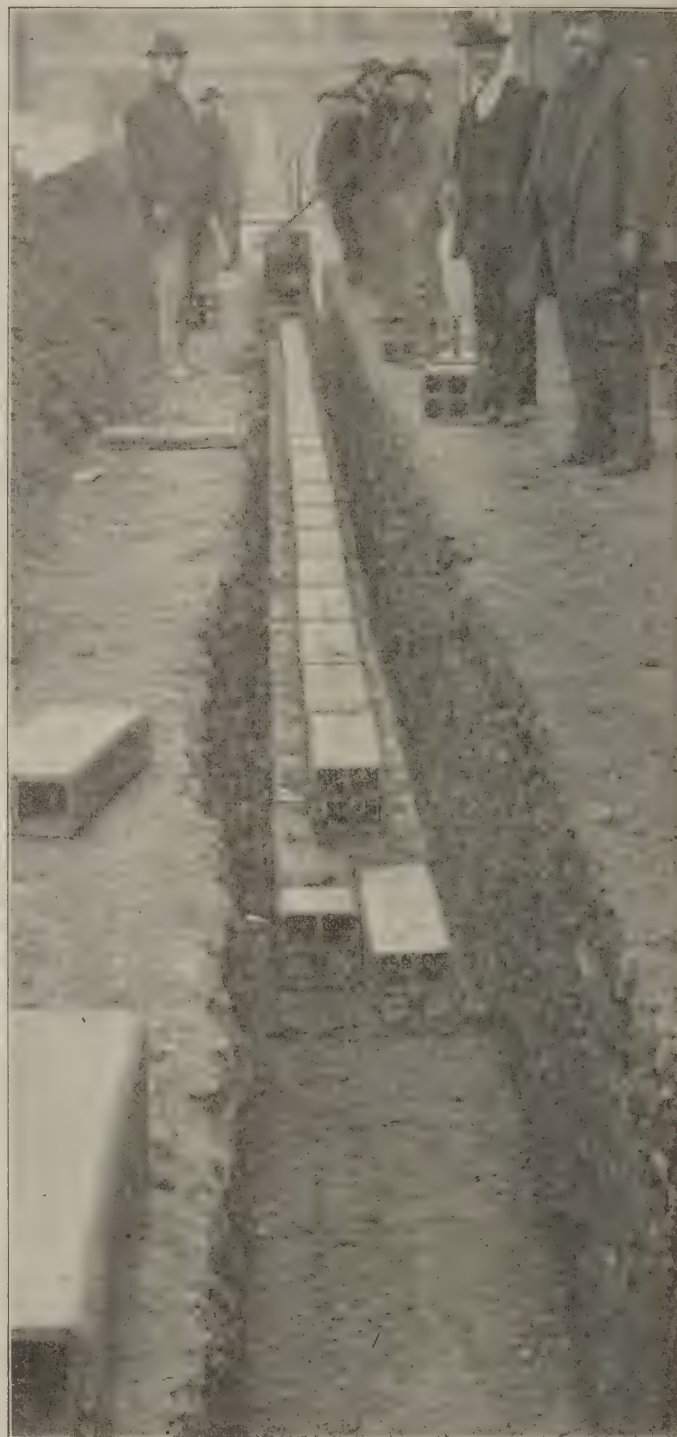


SHOWING COMBINATION OF MULTIPLE AND SINGLE DUCTS.

ducts, and varying sizes of cable. Four curves are shown, respectively marked 4 ducts, 8 ducts, 12 ducts, and 16 ducts. The lower horizontal axis indicates the number of cable pairs while the left hand vertical axis gives the cost per pair-mile. For example: To ascertain the cost per pair-mile of 100 pair cable, placed in a conduit of 8 ducts, follow a vertical line from 100 upon the lower scale until it intersects the curve headed 8 ducts, and

Number of pairs.	Cost per pair mile.
25	\$30.00
50	26.00
75	23.00
100	21.00
150	18.00
200	16.00

then a horizontal line to the left hand scale, finding \$48. Similarly, the cost of open wire lines will depend upon the size of the poles employed, and the number of circuits they carry. But as it is possible to install wire upon poles only as fast as it is needed, as large an allowance for spare wire in aerial construction is unnecessary. There are five curves upon the left hand side of Fig. A so plotted as to give the cost of open wire per circuit mile of two wires, in a manner precisely similar to that



MULTIPLE 12 DUCTS AS LAID FOR THE HOME TELEPHONE COMPANY, BATAVIA, N. Y.

the cost of poles, but the curves here given represent the necessary expense for first class aerial construction under favorable circumstances. The costs include framing, shaving, painting, butt-guarding, pole stepping and repaving the necessary excavation to set poles, and are sufficient to cover a first class installation. The writer has no sympathy with the slipshod attempts at line installation sometimes, though now, fortunately, very rarely seen in Independent exchanges. Barb fence wire tied to a re-

jected bean pole does not make a telephone line, though it may articulate a few syllables under favorable circumstances. A paramount advantage of conduit construction is that it is too expensive to be done poorly, and no one for a moment thinks of building iron wire cables.

From the curves of Fig. A a line of fifty circuits upon 40 ft. poles would cost about \$52 per circuit mile. It is rarely possible and seldom expedient to build heavier lines. The price per pair-mile of 150 pair cable laid in 8 duct conduit, (the most expensive form) is the same, consequently wherever 150 circuits are to be carried, the underground plant is no more expensive than the open wire.

pair cable on a 60 ft. pole line is about the same as a 150 pair cable in an 8 duct conduit.

From these curves the conclusions are in general that underground construction is cheaper than open wire, when more than 150 pairs are to be used, and it is no more expensive than aerial cable when 200 pairs are to be used.

SECOND—COST OF OPERATION.

Turning now to the cost of operation, experience shows that it is *necessary* to allow 6 per cent. per annum upon initial cost of underground wire plant, to cover the maintenance and natural depreciation thereof while on aerial line, including therein



FOUR DUCTS—SHOWING METHOD OF LAYING SINGLE DUCTS.

It is self-evident that aerial cable will usually be cheaper than either underground or open wire, for the aerial cable combines the low cost of wire in cables with the decreased expense of poles versus conduit. The four dotted curves upon the left hand sheet of Fig. A show the expense per circuit mile for aerial cables, containing a varying number of wires, placed upon poles of different heights. In calculating these curves, the additional cost of heavier poles and of stringing the cables has been included. From these curves it appears, that 100 pair aerial cable, upon a 30-ft. pole line, costs about the same as a 200 pair cable in a 16 duct conduit, while the expense of a 100

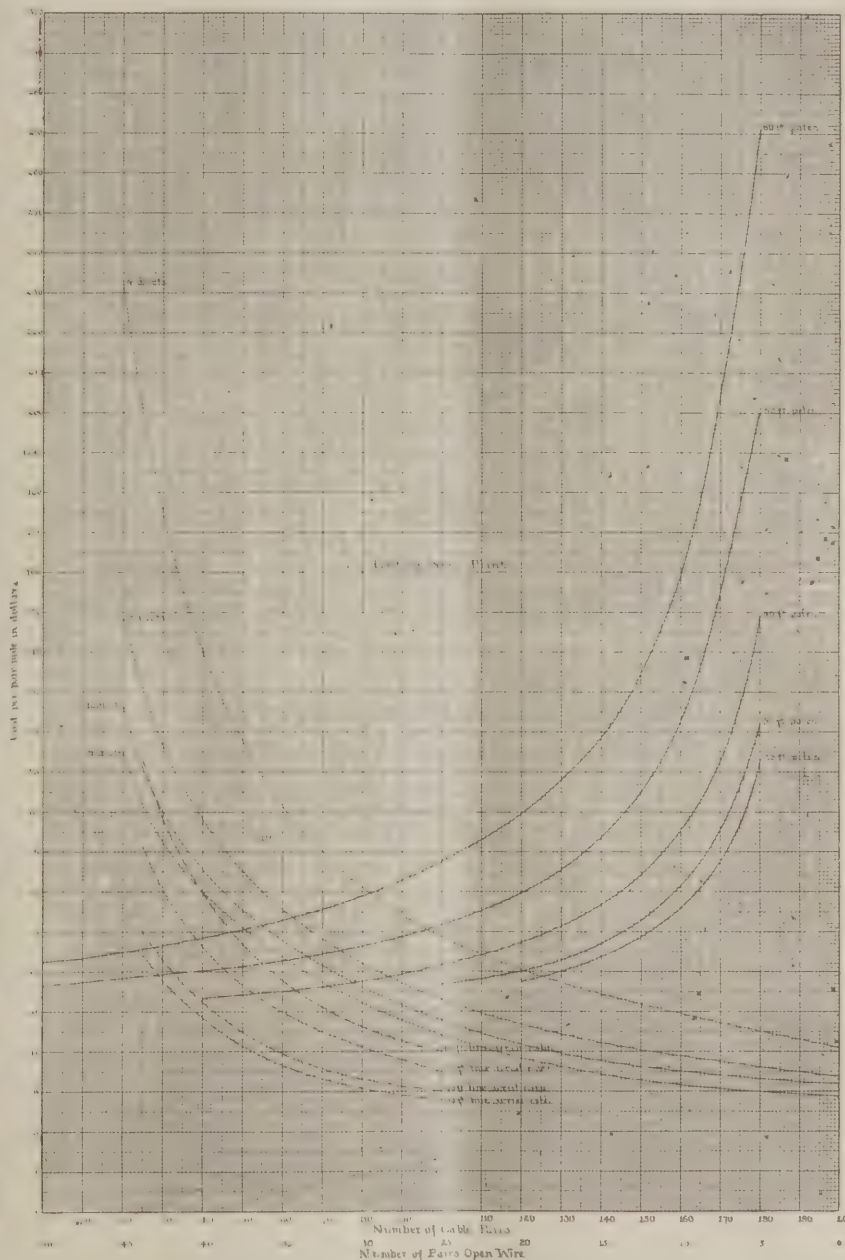


FIG. A.

aerial cable, 12 per cent. per annum is the least adequate rate. It is folly to disregard this charge, and for an association to pass a resolution "that the annual expense of a well built telephone plant is no more than 5 per cent. per annum" reminds one of King Canute and his courtiers. The aerial line has hosts of enemies beside the inevitable decay of unprotected wood set in soil saturated with street drainage. To the small boy with a new shotgun the glittering glass of the insulators and the equally brilliant lead of the cable, offer an attractive mark and each 4th of July or other holiday gives the cable gang a month's work to patch up bullet holes. The slightest fire will either melt open

the lead sheath, or burn off a cross arm. In spite of the best buttguard and protection strips the impact of wheels and the nibbling of horses play havoc with the strongest pole. The sleet storms of each winter levy an inexorable contribution from all pole lines, which the treasury must be prepared to meet. It is obvious that if the yearly expense rate of one plant is double that of another, the annual charges may be capitalized and investment so proportioned as to make operating expenses equal, thus \$200 invested in underground wire plant will not annually cost any more than \$100 invested in aerial lines, and from this standpoint there is little to be shown in favor of aerial construction except in the smallest and most unimportant distributing lines.

THIRD—QUALITY OF SERVICE.

It is impossible to express in dollars and cents the value of reliability in service. The aerial line is notoriously continuously full of trouble—kite strings, falling wire either foreign or domestic, malicious interference, lightning attacks, from whose unexpected pranks no protector always adequately protects, and a thousand and one other minor causes contribute to make the

life of an aerial line exchange wire-chief a burden, and perpetually to promote complaints from subscribers. In addition there are the graver difficulties of storms so severe as to interfere even for a considerable period of time with a large proportion of service. The writer has a very vivid recollection of a couple of sleet storms, that cost for actual reconstruction \$40,000 for one, and \$70,000 for the other, and that cut off for many days the service of some thousands of subscribers. In catastrophies of this kind the expense of reconstruction is really but a small fraction of the total damage inflicted. The underground line is menaced by none of these interruptions, and continuity of service is rarely broken, save when a rearrangement of the cable plant may become desirable.

Good service has been the watchword of the Independent companies. Good service means *continuous service*, good rates, and profitable investments. In spite of the fact that the Bell companies have thousands of miles more of toll lines than the Independents, (which for the present are necessarily constructed of open wire), more than 60 per cent. of the total wire mileage of the Bell companies is underground.

FOREIGN CURRENTS

THE accounts of the Glasgow Municipal telephone system from which we published an extract a week or two ago, have been the object of a good deal of unfavorable comment in the various English electrical journals. It is well known that figures, in the hands of one skilful in dealing with them and not hindered by over-scrupulousness, may be made to show almost anything. In the attempt to prove by the figures of the first nine months' working of the Glasgow telephone scheme that municipal management is the cure for all the ills of telephony it would seem that the attempt has been made to prove too much. One result of the fire of criticism that has been levelled at both the Glasgow and Tunbridge Wells municipal telephone systems, which are practically the only municipal systems of any size yet at work in England, has been to cause other municipalities to hesitate to commit themselves to telephone schemes. At least one has definitely turned down the proposal to establish a municipal telephone system and others that were seriously considering embarking in the telephone business are not nearly so eager to go ahead as they were.

* * *

A very caustic comment on the Glasgow accounts is contained in a recent issue of the *London Electrical Review*. Commenting on the statement that the average cost per line worked out at \$97 as compared with the original estimate of \$95.25, the difference being accounted for by the change from overhead to underground distribution, the critic says that the method of underground distribution adopted must be of an extremely economical character, to have exceeded by only \$1.75 per line the cost of overhead distribution, so that it would seem that the engineer might claim to have carried out the work under the original estimate. It is at the same time worth noting that the precision of the \$1.75 is arrived at after an estimate of \$40 each for 8,787 partially completed lines. If this estimate should happen to be wrong in any way it would vary the \$1.75. In any case this division of the expenditure into completed and uncompleted lines is not very informing. The original estimate was \$605,000 for 5,250 completed lines and 1,200 partially completed lines; 5,250 completed lines at \$95.25 would absorb \$500,062.50, and would leave \$104,937.50 for the partially completed lines, making these latter cost \$87.50 each, only \$7.75 less than the estimate for the completed lines. This hardly compares well with the \$40 now estimated as the cost of the partially completed lines, and the critic thinks it would have been better simply to say that it had been found desirable to undertake construction work for the

future in the proportion of \$351,000 to \$883,000 for the present use instead of \$104,937.50 to \$500,062.50, as originally estimated. The 40 per cent. undertaken is nearer the usual experience than the 20 per cent. estimated.

* * *

With regard to the comparative receipts of \$25.70 per line against the estimate of \$26.25, we cannot but think, says the same critic, that the \$25.70 is too easily arrived at to be entirely accurate. The total receipts for the nine months of \$140,855 are subject to a deduction of \$62,085 for payments in advance, making the receipts for the period of the accounts \$78,770, or at the rate of \$14.35 per line. This analysis would seem to show that the actual receipts per line per annum would be found somewhere between the \$14.35 and the \$25.70. All of which goes to show that the path of municipal telephony is by no means the smooth one to tread or the easy one to follow that it has been made out to be. These criticisms also illustrate very clearly one striking difference between company and municipal management. A company necessarily stands or falls by the results. If it builds its plant above, below, or on a par with the estimates, it accepts the facts and makes the best of them. If it makes a profit it knows it and if it makes a loss it knows that, too, and shapes its affairs accordingly. A company does not have to claim to be right when it knows it is wrong. But a municipality, especially a Scotch municipality, *must* be right and has to go shrieking to the world that it is right, with figures to prove the assertion. And then the unkind critics promptly pull the figures to pieces and put them together again differently and make them prove something else. Moral, be a company if you can, but if you have to be a municipality don't go into extraneous business.

* * *

One disadvantage of two competing telephone systems in the same city, which is always emphasized by those who believe that the telephone service is a natural monopoly, is that busy firms find themselves practically obliged to subscribe to both services. A hitherto unsuspected advantage of having a telephone connected to each system on the same premises is the opportunity offered to those of an investigating turn of mind to test the service by the simple expedient of calling one telephone from the one hanging alongside it. Our London contemporary, the *Electrical Review*, has both the National and the Postoffice telephones in its office and on making this test the other day—presumably with the object of timing the service—was informed that the line wanted was *busy*. Unfortunately, the line wanted, or at least the station wanted, was in plain sight of the caller and was not only not busy but was actually waiting for the call. Comment on such a sad result as this, so distressingly confirmative of the opinion the average telephone subscriber has about "busy," is needless; there may be an excuse in the way of a false busy test or London operators may be allowed to say busy when all the trunks are busy, but on the face of it it looks like slack operating.—*The Arrester*.

ENFORCEMENT OF THE TIME LIMIT ON TOLL MESSAGES*

By W. W. DILWORTH.

WE ALL know it is hard for one company to be strict in the enforcement of the time limit when his neighbor pays no attention to such a rule.

Now, we all have customers who do a large toll business and who are hard to hold right up to the time limit, but, with the increasing toll business, we must measure time accurately or go out of business.

While none of us is much in love with the Bell or Missouri and Kansas Telephone Company, yet they do some few things which we could well afford to copy, and the enforcement of the time limit is one of the few.

Why should we allow our patrons to use our lines eight, ten or twenty minutes overtime any more than the Bell Company allows it?

Over-mileage is not expected of the great railroads, nor overweight nor over-measurement of our merchants—then why should we be expected to grant overtime without extra charge.

I am of the opinion that a limit of five minutes would be about the proper thing for a single rate, but the matter of charging for overtime is not quite so easily adjusted—that is, you cannot well charge for overtime on a pro rata basis where the message passes over two or more lines, and make a true division without in some cases splitting a nickel. I would suggest, therefore, that the time limit be fixed at five minutes, and when the line is held

over five minutes and not exceeding eight minutes, an additional charge of five cents be made for each company over whose lines the message passes, provided that the charge for overtime shall not be less than ten cents; and when the line is held more than eight minutes, an additional charge of five cents shall be made for each company over whose lines the message passes for every four minutes that the line is held, provided that if the line is held twelve minutes the charge for overtime shall not be less than one full rate, and the charge for each additional eight minutes shall not be less than one full rate.

I do not think that there would be more than 5 per cent of the business messages that pass over our lines that would exceed the time limit, and for these we should have no trouble in collecting for overtime. The people who bother us most and hold the line the longest are those who visit over the telephone—a class of business that, as a rule, is most unsatisfactory.

There are a good many reasons why we should adopt the time limit rule, but the fact alone that we allow our patrons to talk five minutes, as against a ten-word message transmitted by the Western Union Telegraph Company, is a sufficient reason why we should adopt the rule; and, again, when we take into consideration the cost of construction, maintenance and operation of our toll lines, it is a fact that we give our patrons more for their money than any other class of people that are doing business with the public to-day.

THE INTERSTATE TELEPHONE COMPANY OF N. J.

FREQUENT mention has been made recently in these columns of the wonderful development in the Independent telephone field that is taking place in the Eastern States. It has been pointed out that although the Middle West is the birthplace of the Independent telephone movement, and in that territory it has had its most enthusiastic welcome from the public, the East is now fully alive to the possibilities of the telephone situation. The East is naturally conservative in all things. It lets the other fellows do the experimenting. But once a new departure is proven successful the Eastern States invariably take hold with a vim and quickly forge ahead. A good example of this, outside of the Independent telephone field, is the modern "skyscraper" office building. The first attempts at towering office structures were made in Chicago by Western architects. The Eastern architects pooh-poohed the idea of building more than ten stories successfully, on account of the thickness of walls necessary at the base. But the Westerners, less conservative than their Eastern colleagues, vigorously attacked the task and evolved the modern steel-frame construction, which makes it possible to build to an almost unlimited height with perfect safety and employing comparatively thin walls all the way up. Once it had been proven that "skyscrapers" were practicable the Eastern architects took hold of the scheme, and it has been in New York that the greatest development has taken place.

This same condition now obtains in the Independent telephone field. New York State, Pennsylvania and West Virginia have been alluded to in other articles as bearing out this statement. Another State showing a wonderful development of comparatively recent growth is New Jersey. The system of the Interstate Telephone Company, with headquarters at Trenton, covers practically the entire State. The company at present has plants in operation in Trenton, Bordentown, Mt. Holly, Moorestown, with trunk lines connecting all towns in their vicinity; Paterson, Passaic, Elizabeth, Atlantic City, Ocean City, Tuckahoe, Mays Landing, Egg Harbor City, Belle Plain, Leesburg, Woodbine, Port Norris, Port Elizabeth, Maurice River, Millville, Vineland, Bridgeton, Salem and Cape May Courthouse.

Many of these cities are already connected by toll lines, and plans are being made to construct a trunk line across the State to connect all the plants in Southern New Jersey. In all these plants the company now has about 4,000 subscribers, although the system is yet but a year or two old. Many of the systems in the above-named towns are cramped and out of date. Plans are on foot for rebuilding Paterson, Elizabeth and Atlantic

City. When this is done the towns named will have a capacity to serve 25,000 subscribers.

At Trenton one of the very finest plants in the country has just been completed. The switchboard was manufactured by the American Electric Telephone Company and has a capacity of 5,000 lines. Telephones are now being connected to the switchboard as rapidly as possible. In the underground section the company has laid nearly 300,000 duct feet of conduit. It has a very large mileage of aerial cables in the residence section, and inside of a year expects to have between 3,000 and 4,000 subscribers at this place.

All of the plants owned and operated by this company are paying on the present investment, but many of them are handicapped because the original construction did not provide for such an increase as has come. Consequently the existing systems will in many cases have to be rebuilt.

Beside the towns mentioned above, the company has franchises in many other New Jersey towns that will be equipped as soon as time and means permit.

The officers of the company are C. W. Kline, president; A. M. Worstall, secretary; Barker Gummere, Jr., treasurer, and F. A. Demarest, general superintendent.

MICHIGAN TELEPHONE COMPANY PROPERTY.

THE American Telephone and Telegraph Company has recently had a complete examination and inventory made of the Michigan Telephone Company property. The work has been in progress for fully four months, and the report has just been filed. At the same time Messrs. Stone & Webster have been making an expert examination of the property in the interests of bondholders, and it is expected that their report will be ready at an early date. The showing made by the American Telephone experts puts the value considerably below the bondholders' estimates made in the past. It is the opinion of the American Telephone people that the Michigan Company's bonds must be scaled in order to allow of a reorganization plan that will be entirely satisfactory and that will provide the needed \$1,500,000 of new money. It is estimated that this scaling may amount to 40 per cent. for which, however, the company is perfectly willing that junior securities should be given, which shall share in any profits that may accrue above the actual fixed charges. Unless an arrangement in accordance with this general idea is agreed to by the bondholders' committee, it is more than likely that a receivership will be created.—*Commercial*, N. Y.

*NOTE.—Paper read at the Kansas State Convention, Kansas City, September 11 and 12.

Opinion and Comment

TELEPHONY AND THE CENSUS

PROBABLY the first official recognition of Independent telephony, except that early claimed in the law courts, is contained in the Census Bulletin just issued on Electrical Apparatus and Supplies, one of the many interesting and informing documents that have flowed from the enormous mass of data collected by the Twelfth Census of the United States. This special report has been compiled by Mr. Thomas Commerford Martin, acting as Expert Special Agent. Mr. Martin is the editor of our well-known contemporary, the *Electrical World and Engineer*, and having long held a leading place in technical journalism, is well qualified to deal even with the extremely wide range of subjects covered by his report.

He bears eloquent testimony to the astonishing growth of Independent telephony. After giving the principal figures for the Bell system he says: "These figures would in themselves indicate the stupendous growth of a distinctively modern industry but they are far from revealing the actual conditions. Beginning about 1894-5, 'Independent' telephone exchanges sprang up like mushrooms all over the country, but more particularly in the Middle and Northwestern States, and by 1900-1901 they had attained a total of about 2,750 exchanges, with 700,000 subscribers and an investment of \$150,000,000, apparatus being furnished by at least three-score manufacturers. It will be observed that the output of apparatus for telephone purposes in 1900 reached \$10,512,412, scattered through nearly a score of states. These figures, however, are strictly those of the manufacturing side of the industry, and do not take any account of the far more striking data to be derived from a study of the subject after the apparatus has gone into service and is in the hands of the public. It will suffice to point out that in 1900 the United States showed a per capita of 1 telephone in 40, while in some places, such as San Francisco, it had reached 1 in 12, a rate that leads the world and has been growing with unprecedented rapidity."

The figures which Mr. Martin gives indicative of the growth of Independent telephony would be wholly eclipsed at the present time, as the growth during the past two years has been far greater than that of the whole period covered by the report. The report goes on to describe in an interesting manner the various changes and modifications that have come about in the working of the telephone. In speaking of the multiple switchboard currency is given to the assertion that "A further use of the multiple-board principle may even bring 100,000 subscribers within reach of one girl at 'central.'" Mr. Martin traces the evolution of the exchange system from magneto working through the self-restoring drop period to the present era of "central energy," that swift and automatic method which the Independents have done so much to develop and to make available for systems of all sizes, down to the very smallest.

THE TELEPHONE IN RAILWAY WORK

THE signs multiply from day to day of the growing importance of the place that the telephone is taking in steam railroad operation. For many years the railroad people have had a deep-rooted prejudice against the telephone, based as prejudices generally are, mainly on sentimental grounds. The telegraph and the railroad have always been firm friends and allies; railroad men have always been accustomed to depend on the telegraph for all rapid communication; about the telegraph they knew quite as much as they wanted to know, or as was good for them to know, and about the telephone they neither knew nor wanted to know anything at all, except that it gave no record of messages whereby errors could be traced. This prejudiced and superficial attitude of railroad men toward the telephone has been generally strengthened by the railway telegraph superintendents, who, with a few brilliant exceptions, are blind devotees of the telegraph, and being afflicted with the unprogressive mind that seems to be associated with the telegraphic profession could see no good in the telephone.

The most serious charge made against the telephone by telegraph men is that the similarity of sound of certain letters is apt to lead to errors in writing down messages, and that the machine itself makes no mechanical record by which the message may be checked and errors traced. Of course a telegraphic message with an error is an unheard of thing, and it is a well known fact that every telegraph operator in the country can be depended on always to transmit exactly what he sees and to write down exactly what he hears. True, one does sometimes hear of suits against the telegraph companies on account of erroneous telegrams, and railway accidents due to wrong messages have been known to occur. Speaking seriously, however, it is a fact that if properly organized the transmission of messages by telephone can be made even more accurate than by telegraph, and the important point is not the tracing of the responsibility for errors, but the prevention of their occurrence.

Railroad men are beginning to overcome their prejudice against telephony and to recognize the great capabilities of the telephone and its enormous possibilities of usefulness in railroad work. Most of the large railroad systems now use the telephone very extensively, both for local and long-distance work, and the number of special applications of telephone working to railroad conditions is increasing daily. The most up-to-date trains have a telephone station on board, which is connected to the local system at important stations. Experiments in telephoning from moving trains have been made frequently within the past few months, and a successful system will no doubt soon be evolved; the day of the telegraph in railroad work will then be nearly over. For communication with breakdown gangs working on the tracks the telephone is already used extensively, and this kind of service is of the utmost value. By reason of its greater flexibility, directness and rapidity the telephone is certain eventually to replace the telegraph in railroad operation.

IN THE OPERATING FIELD

NOT TO BE A MERGER

A COMBINATION of the York State Telephone Company of Elmira, N. Y., and the United Telephone and Telegraph Company, of Philadelphia, was reported a short time ago, to be under consideration, if not actually effected. This has been emphatically denied by W. D. Barnard, of Philadelphia, who has interests in both companies. In writing to the AMERICAN TELEPHONE JOURNAL recently, Mr. Barnard gives the following information in regard to the two companies mentioned above:

"The York State Telephone Company, of Elmira, N. Y.," he says, "was organized under the laws of the State of New York, with \$2,500,000 capital, for the purpose of consolidating the properties of the Binghamton Telephone Company, the Elmira Telephone Company and any other properties in that section of the State that would be profitable to take in, and also to run a line through New York State to connect with Albany, Troy, Glens Falls, and Saratoga, and also to connect with Syracuse for points east and west on the New York Central line on the north and with the United Telephone and Telegraph Company at Williamsport, on the south. It is the purpose of this company to develop Central New York State and all of that territory in Pennsylvania lying between the United Company's lines and the northern border of the State of Pennsylvania.

"The United Telephone and Telegraph Company, of Philadelphia, does not own a share of stock of the York State Telephone Company, nor has it absorbed it. Of course, the parties who are in control of the United Company are also in control of the York State Company.

"The United Telephone and Telegraph Company operates east of Altoona in the State of Pennsylvania and in Maryland, Virginia and West Virginia, and has close to 18,000 telephones and 2,500 miles of trunk line working at this time."

TELEPHONES IN ONE IOWA COUNTY

A COMPILATION of the telephone service in Linn County, Ia., has recently been made by the editor of the Springfield (Ia.) *New Era*. The editor reaches the following conclusions:

"There are in Linn County 83 distinct telephone companies, operating over 887 miles, having an assessed valuation of \$28,186.25. These are stupendous figures when it is considered that the growth has nearly all been made within the past few years. There is a network of wires stretching in every direction, figuratively speaking, and it is possible to reach almost every farmhouse and practically every residence in the towns and villages of the county. The farmer can sit in his house a dozen miles from town and yet be in constant communication with any part of the county. He receives the daily market reports and can sell his produce by telephone when he finds the market most favorable.

"The property of the various companies is valued from \$6.50 to \$6,906.25, the latter amount being the value of the Cedar Rapids and Marion Company's property. The shortest line is one mile long, and the longest is 106 miles, belonging to the Iowa Telephone Company. The larger part of the telephones of the county are owned by small companies, such as are found all over Brown township. The assessments upon the various companies for the year 1902 will be in the neighborhood of \$3,946, of which \$917 will go to the state."

COMBINATION OF IOWA INTERESTS

IT has frequently been stated in the past two or three weeks that plans are being prepared for a combination of all Independent telephone properties in Northern and Central Iowa. If successful, it would result in one solid Independent aggregation of forces in about 40 counties in the state to fight the Bell companies. The combination, it was stated, would be effected by the same syndicate which recently purchased the Mutual Telephone Company in Des Moines, Ia., of which George N. Bandy is vice-president and general manager and the leading spirit. The headquarters would be located in Des Moines and under the management of Mr. Bandy and his associates.

Two methods of consolidation were reported to be under consideration. One contemplated an assumption by the new company of the charter and franchises under which they are now working, and a guarantee that rates will be maintained as at present, with the refunding of the several debts by a bond issue sufficient to meet them all, to be secured by a trust deed executed against the entire property of the combination. Stock was to be issued in the new corporation in proportion to the actual valuations of the properties of the concerns taken over.

The other plan provided for the organization of an operating company. This company would take leases for stated terms, guaranteeing maintenance of service at the present rates, the creation of a sinking fund to take care of the indebtedness of the companies, and the payment of a stated dividend on the stock of the concerns taken over. It was stated, however, that this would only be a temporary arrangement, the ultimate intention being to secure absolute title in the name of the operating company.

This merger would, it is said, be a good thing for the Independents of Iowa, for it would not only enable them to better compete with the Bell Telephone Company, but also to decrease the operating expense, strengthen the service and better it, and greatly improve the state toll line service. Many of these latter almost parallel each other, being operated by different companies. If the merger should be effected there would be a great saving in this way as many of the toll lines could be eliminated.

Mr. Bandy, in writing recently to the AMERICAN TELEPHONE JOURNAL, says that a merger on the lines above shown, is under consideration. He added, however, that nothing definite could be known about the proposed combination until February or March of next year. The matter, thus far, has only been discussed; no action whatever has been taken.

HAMPTON TELEPHONE COMPANY TO BE SOLD

NEGOTIATIONS are pending by which the controlling interest in the Hampton Telephone Company, of Hampton, Va., is to be sold. It cannot be learned, as yet, who are the prospective purchasers, but authoritative statements have been made that the Hampton company will pass under the control of the Southern Bell Telephone Company.

S. Gordon Cummings, of the Hampton Company, writes to the AMERICAN TELEPHONE JOURNAL as follows:

"I am not at liberty at the present time to discuss the status of the Hampton Telephone Company, further than to state that negotiations are now pending, if they have not been closed, by which the holders of the controlling interest in the stock of the company will dispose of their interest, wholly or in part.

"My information," continues Mr. Cummings, "is such that I have every reason to believe that the integrity of the Hampton Telephone Company will be maintained for some time to come, though, in view of the fact that I am about to dispose of my interest, it may be stated that I am not fully acquainted with what the future may bring forth."

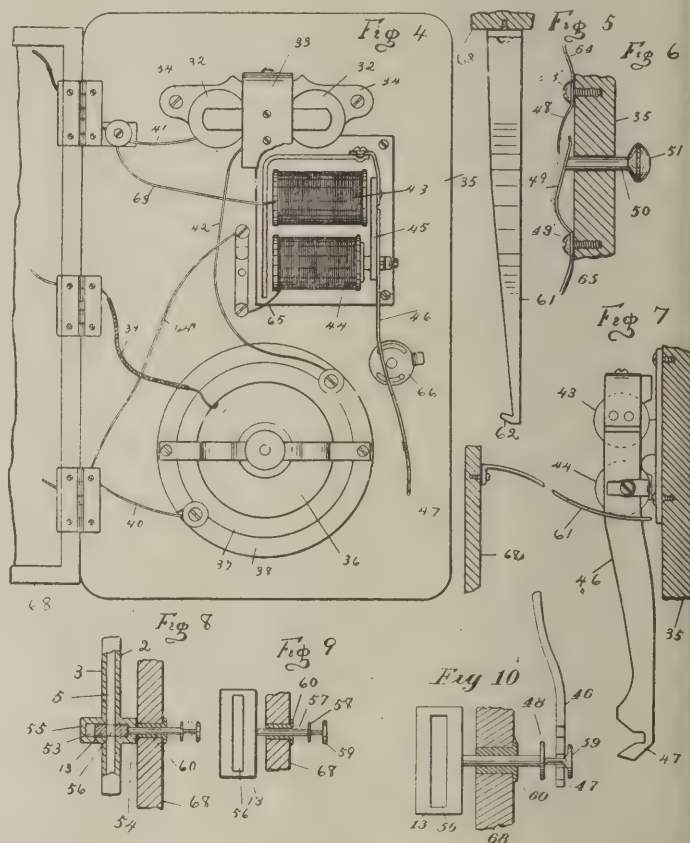
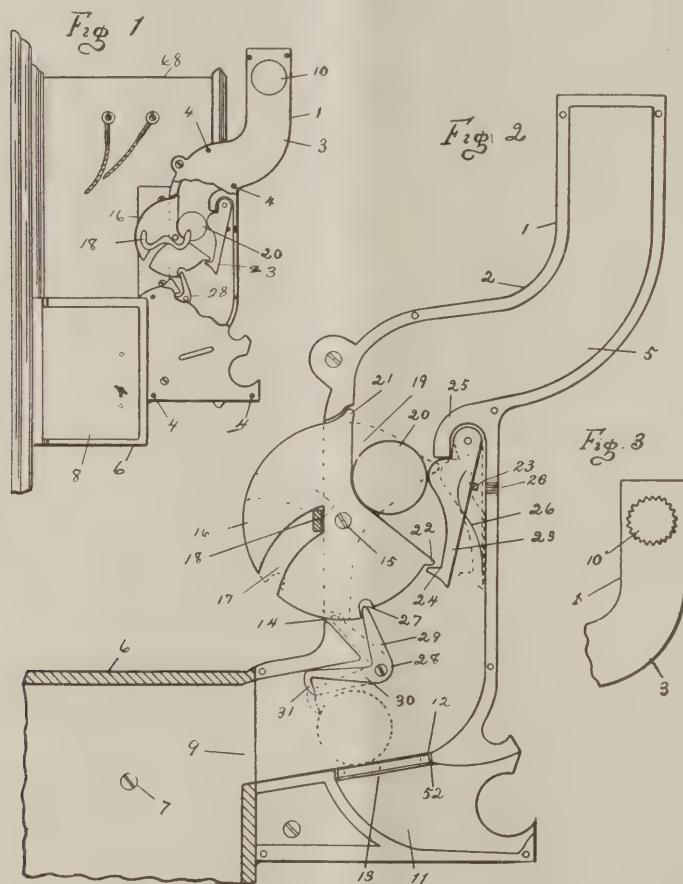
AN OPENING FOR AN INDEPENDENT COMPANY

IF an Independent telephone company should lay its plans to install a system in Newbern, Tenn., the telephone users in that place would be found in a particularly receptive mood, to use an expression usually employed in politics. The word "particularly" is used advisedly. An Independent invasion is invariably welcomed by any community. But in Newbern, as before stated, it would be particularly welcome. The reason for this is the recent high-handed edict issued by the Cumberland Telephone and Telegraph Company, which operates a system there. On August 15 it notified its patrons that unless they were subscribers on a certain class of line, they would be cut off from all county connections, receiving only local service. This order affected nearly every subscriber in the town, and a rebellion was at once organized. The subscribers in Newbern particularly prize connection with Dyersburg, the county seat, and they have notified the Cumberland Company that they will throw out its telephones if terms satisfactory to themselves are not agreed upon.

Patents

Sylvester P. Grey, of Fort Wayne, Ind., patents (No. 708,138, September 2, 1902) and assigns one-half to Franklin Howenstein, of same place, a coin controlled telephone. The object of the invention is to provide an efficient and reliable coin-controlled telephone attachment of economical construction specially designed for public stations, so constructed that a coin of predetermined size and value must be deposited therein to establish the circuit with the central office and also so arranged that in case for any cause there is failure to get the desired connection the central operator can return the deposited coin. The box is also protected against intruders and cannot be opened except with the co-operation of the central operator. In the drawings, Fig. 1 shows the coin mechanism attached to the telephone box; Fig. 2, the details of the machine; Fig. 3, a special opening in the coin chute to register with special metal checks that may be used instead of coins; Fig. 4, the ar-

disk 16, and later either to the cash box 6 or the return chute 11. The coin opening 10 is at the side of the chute, with the object of preventing any tampering with the mechanism by the insertion of wires or blades in the chute. The disk 16 is revolved by the hook switch lever 18, which fits in the radial slot 17. Normally the disk is held in position by the hook 24 on lever 23, pressed forward by spring 26 bearing against the lug 22 on the disk, and the disk cannot be revolved in the absence of the coin 20. The disk 16 is cut away at 19 to form a recessed surface, into which the coin drops fitting snugly between the surface 19 and the cam shoulder of lever 23. On raising the switch hook the lever 23 is forced back, clearing the hook 24 of engagement with the lug 22 and as the disk comes around to the position shown in dotted lines in Fig. 2 the lug 21 of the disk bearing on the cam shoulder forces 23 clear back against the wall of the chute, making a clear passage for the coin. Below the disk is the holding pawl 28, having upper arm 29 normally engaging in notch 27 in 16 and lower arm 30 with hook 31 adapted to drop by gravity across the channel of the chute. When the disk is turned to the left 29 drops out of 27, and the periphery



range of the door of the call-box; Fig. 5, the special hook for locking the box; Fig. 6, the push-button contacts for closing the circuit of the coin releasing magnet 43-45 (Fig. 4); Fig. 7, the armature of the coin releasing magnet, with lever 46 and hook 47, which operates the slide valve (shown in Figs. 8, 9 and 10), controlling the aperture 52 (Fig. 2) leading to the return chute 11. Fig. 7 also illustrates how the hook 62 at the end of bar 61 engages with the armature lever 46 to lock the box until the operator at the request of the inspector, energizes the magnet 43-45 and attracts the lever 46 out of engagement with hook 62. The bar 61, terminating in hook 62, being attached to the back of the box, and the magnet and armature to the door, the engagement of 62 and 46 will hold the door closed even if some unauthorized person succeeds in opening the lock 66. The coin mechanism consists of the chute formed of two plates, 2 and 3, bolted together by bolts 4, which leads the coin to the peculiarly shaped revolving

of 16 being somewhat cut away between notch 27 and lug 22 the disk passes 29, allowing the hook 31 to come forward in the chute to obstruct the progress of the coin. As shown by the dotted lines the lug 21 bearing on 29 holds the hook 31 in this position as long as the disk is kept turned to the left by the switch-hook lever being up. The coin is now held immediately over the slide valve 13, closing the aperture 52 into the return chute 11. If the connection cannot be had the operator opens 13 and the coin drops through 52 to 11 and can be recovered by the caller. If the connection is completed the slide 13 remains closed and the coin, disk and other parts remain in the position shown in the dotted lines in Fig. 2. On restoring the receiver to the switch-hook the level 18 turns the disk to its normal position, 29 falls back into notch 27 raising hook 31, and the coin rolls down into the cash-box 6. The slide valve 13 is opened by the armature lever 46, having hook 47, which works between the collar 58, 59 on the pin 57 attached to 13 (Figs. 7, 8, 9 and 10). Fig. 8 shows the slide in section, working in slots 53 in the sides of the chute. When a coin is to be restored to the caller the button 51 is pressed, closing the circuit of magnet 43-44, the operator then energizes the magnet, the attraction of the armature resulting in the lever 46 moving the slide 13 so as to make its opening register with the slot 52, allowing the coin to fall into the open receptacle 11.

TWO LEGAL DECISIONS OF INTEREST TO TELEPHONE MEN

By IRVING M. BLAKE

TWO legal decisions handed down recently will have a very important bearing on the action of telephone companies in this country, in the future. Both suits were originated against telephone companies, while they were in the act of stringing their wires, under proper franchises. Ever since the invention of the telephone, and the consequent building of lines to carry telephonic messages in the cities, towns and country districts, they have met with more or less opposition from property owners.

In one of these decisions which was given in Owosso, Mich., the Union Telephone Company was the defendant. The suit was brought by William Maudlin, who was awarded damages to the extent of 6 cents. But despite this fact, the decision is in favor of the telephone company. The cause of the suit was this: Linemen of the Union Telephone Company, while stringing wires on the public highway in front of the Maudlin home, trimmed the trees in order to get a clear path for the wires. Maudlin, because they had not gotten his permission, became greatly enraged at their course, and forcibly ejected them and stopped the work. He was promptly arrested. While he was in town settling the legal proceedings the linemen returned to work and completed their task, trimming such trees as were found necessary to the proper erection of the lines.

Later he began suit for damages for unnecessary and excessive trimming of trees, for false imprisonment, for malicious prosecution, and for abuse of process by defendants. When the suit came up for trial, Maudlin voluntarily withdrew his claims for false imprisonment and malicious prosecution. The judge ruled that the claim of abuse of process was nil. That reduced the case to the claim for damages on the alleged ground that the trimming done by the linemen was unnecessary and excessive.

In his charge to the jury, the judge said the linemen had a perfect right to erect telephone poles and string wires along the highway in front of plaintiff's house, to cut away and trim out any obstructing branches of trees, sufficient to admit of the free passage of wires along the highway in front of plaintiff's house, the company being answerable only for any unnecessary, improper or excessive cutting of said trees.

"The plaintiff," he said, "is not entitled to damages for any necessary or proper trimming of the trees in question."

The jury was out just one hour, and then returned, awarding Maudlin 6 cents damages.

The other decision gives telephone companies in the State of Pennsylvania the right of eminent domain. The court held that, not only have the companies a perfect right to erect lines along the highway but that, in order to render the best service to the people of the state, and under the laws of the state, a telephone company has a right to build its lines on private property.

The story of the case runs as follows: The Pennsylvania Telephone Company in constructing a line from Elizabethtown to Tremont, wished to go over the property of Charles Hoover, living near Elizabethtown. Hoover gave the company permission to construct the line across his property, subject to his approval, but not to put up the line until the company had paid him \$5 a pole, which the company declined to do. Hoover accepted a bond from the company, but its acceptance, the court held, was not giving permission to erect the line until condemnation proceedings had been taken.

Hoover, however, when the company began constructing the line over his property, kept the linemen from so doing. The company then sought an injunction to restrain Hoover from interfering with the construction of the line. Judge John H. Weiss, of the Dauphin County Court, before whom the suit was brought, in rendering the decision, held as follows:

"The contention of the defendant is that the Act of 1874 gives to telephone companies only the right to construct their lines upon public roads, streets, or highways, that the designation 'lands' comprises only the land occupied by the highways and not private land, and that the occupancy of the roads by a telephone company subjects the land to an additional servitude for which compensation must be made to the owner.

"It is manifest, however, that the word 'public' was not intended to apply to or qualify 'lands.' That would suggest that while a telephone company may construct its lines along and

upon public roads, streets and highways, it may do so upon public lands only, which would signify lands owned by the state, a county, or municipality. The mandatory line 'but the same shall not be so constructed as to incommode the public use of said roads, streets or highways' omits the word 'lands,' which makes it demonstrably certain that 'lands' was intended to be a general and not a particular designation.

"The words 'absence or legal incapacity of the owner or owners' respecting the agreement for damages for the right to enter upon lands or premises, in Clause 2 shows that 'lands' was in legislative contemplation a thing apart from 'roads,' streets or highways.

"The word 'premises' in the same clause coupled with 'lands'—'lands or premises'—is also an index that the term 'lands' is dissociated from roads or streets. We speak of leasing premises but we do not thereby mean or intend lands occupied in part by roads and highways.

"The paragraphs of the Act of 1874, commencing with: 'In all cases where the parties cannot agree' is an almost literal transcript of Sec. 2 of the Act of April 9, 1856 (P. L. 288), which is a supplement to the general railroad act of 1849. The railroad Act authorizes a company 'to enter upon and into and occupy all land on which the railroad * * * may be located.' The Act of 1874 gives to a telephone company 'the right to enter upon lands or premises for the purposes of constructing lines' by the erection of the necessity fixtures * * * or wires of such lines.

"There is thus a kinship between the Act of 1849, its supplements, and the Act for the construction of telephone lines of 1874, authorizing the entry upon land warrants the conclusion that the rights, privileges and powers given to one, are given to and exercisable by the other.

"It is made the duty of telegraph, and consequently of telephone companies 'to receive dispatches * * * and upon payment of charges, to transmit the same with impartiality and good faith.'

"This, in the language of the Chief Justice, in *Ellis vs. American Telegraph Co.*, 13 Allen (Mass.) 231, 'Takes the business of conducting and managing a line of electric telegraph within this commonwealth out of the class of ordinary private occupations, and makes it a quasi public employment to be carried on with a view to the general benefit and for the accommodation of the community, and not merely for private emolument and advantage.'

"The right to take private property for public use arises out of the inherent power in the sovereign to grant franchises or lands to an individual or corporation, the proprietorship of which is for that purpose at least, retained by the sovereign, subject only to the right of the owner of the land to proper compensation.

"The right of the public in the community in which a telephone company does business, to its service, for the transmission of messages upon payment of the usual charges according to established regulations, constitutes a public use or employment.

"The Act of 1874 provides for the condemnation of property before it can be taken for use by a telephone company, and this is a feature which enters into the determination of the right of occupancy of lands for construction purposes.

"The diligence of counsel was not rewarded by any authority decisive of the precise question, but Joyce in his treatise on Electric Law cites a number of cases in which the right of eminent domain is recognized rather than authoritatively laid down.

"In *Smith vs. Western Union Telegraph Co.*, 83 Ky. 104, Holt, J., says: 'It is chartered for public purposes; extraordinary powers are, therefore, conferred upon it; it has the power of eminent domain; if it did not serve the public it could not constitutionally lay a wire over a man's land without his consent.'

"The bond tendered by the plaintiff having been accepted and considering that the general railroad act and the Act of 1874 are closely related in phrase and purpose, we are led to declare that the complainant has the right to enter upon the lands of the defendant, for the purpose of constructing its telephone line over, across, and upon his land, so, however, as to cause the least possible inconvenience and injury to him or his lands and not at, near, or upon any building or buildings, and that the defendant has no lawful right to resist or interfere with its so doing."



New Companies

SELBYVILLE, DEL.—The Selbyville Telephone Company, of Selbyville, has been incorporated with a capital stock of \$30,000.

CHICAGO, ILL.—The National Telegraph News Company has been incorporated with a capital stock of \$150,000. The National Telegraph News Company was organized in August, 1900, and its main office is in Chicago. By its charter its business is "telegraphing and telephoning, collecting and disseminating news of every description, the transmission of current and in establishing messengers or any other means for the delivery, collection and dissemination of such news." It is understood to be the intention of the company to build a line to St. Louis with branching lines from the county seats of the counties through which it will pass. The incorporators are L. M. Martin, F. E. Crawford, W. R. Stewart, Jr., who with A. K. Brown and A. T. Stewart constitute the board of directors.

CORNELL, ILL.—The Cornell Telephone Company, Cornell, has been incorporated with a capital stock of \$5,000, to operate and maintain a telephone system. Incorporators: George Whitman, John F. Snyder, H. W. Smith, C. E. Lishness and Grant Calvin.

NUNDA, ILL.—The Union Light and Telephone Company, of Nunda, has been incorporated with a capital stock of \$10,000. It will conduct a telephone and lighting business; incorporators, E. G. McCullum, H. H. McCullum, J. A. Crell.

RUSSIAVILLE, IND.—The business men of Russiaville are organizing a co-operative telephone company and will have connections with Frankfort, Forest, Middlefork and other towns in the county.

LATIMER, IA.—Articles of incorporation have been filed with the secretary of state by the People's Mutual Telephone Company of Latimer, Franklin County; capital \$25,000.

SHENANDOAH, IA.—The Independent Mutual Telephone Company has been incorporated and its principal place of business is Shenandoah, Page County, Ia. The general nature of the business to be transacted by said corporation is the erecting, constructing, maintaining and operating of telephone systems, exchanges, switches and toll lines and the buying, selling and leasing of telephone systems, exchanges, switches, toll lines and apparatus. The authorized capital stock is \$50,000, divided into shares of \$100 each. All stock subscribed for shall be issued and paid for at the call of the board of directors. Twenty-five thousand dollars of the capital stock shall be issued as preferred stock, upon which a dividend of 10 per cent. per annum, payable semi-annually, shall be paid in lieu of all further dividends or interest in the profits; the said semi-annual dividend to be paid June 10, 1903, and each six months thereafter. Said preferred stock shall be first lien against the property and assets of the corporation and the dividends on said preferred stock shall be a first lien against the net income of the corporation.

CLYDE, KAS.—The Northern Kansas Telephone and Telegraph Company, of Clyde, has been incorporated with a capital stock of \$25,000.

PORTLAND, ME.—The National District Telegraph Company has been organized at Portland for the purpose of constructing and operating telegraph, telephone and electrical lines with \$250,000 capital stock, of which \$1,000 is paid in. The officers are: President, George H. Fearons, of West End, N. J.; treasurer, John C. Willever, of Wyoming, N. J.

SWANS ISLAND, ME.—The Swans Island Telegraph and Telephone Company has been incorporated with a capital stock of \$5,000. The company will install a large number of local telephones and connect with the outside world by means of a cable to extend to Tremont. Officers were chosen: H. W. Joyce, president; H. W. Small, secretary; A. C. Smith, treasurer; Isaac W. Stinson, vice-president. The above with the following are the directors: Wm. Herrick, Wm. H. Lindsay, of Carlyle, Pa., Linwood E. Joyce, Stinson Hooper, Calvert Bridges, Seth G. Stockbridge.

NORTON, MASS.—Plans are under way to establish a telephone system in Norton, for a local system to be built and managed by local parties only. An organization has been partially effected, with Andrew H. Sweet, president of the Norton and Taunton Street Railway Company, as treasurer, and Dr. A. M. Round, W. E. Leonard, and Dr. S. V. Cole, president of Wheaton Seminary, as promoters. It is proposed to establish this line at first in Norton and then extend it to the farming districts until most of the county is covered. The new company will ask for a charter.

HANNIBAL, MO.—The new Hannibal telephone system will soon be in operation. The Miller Township and Hannibal Telephone Company has been absorbed by this company and the articles of incorporation have been filed. The incorporators are: C. H. Brown, Greenville, Ia.; H. G. Conger, Mt. Pleasant, Ia.; J. C. McCord, Mt. Pleasant, Ia., and B. E. and R. L. Hixson, of Hannibal. The officers are: H. C. Brown, president; H. G. Conger, secretary, and J. C. McCord, H. G. Conger, C. H. Brown, B. E. Hixson and R. L. Hixson, directors. The contract for putting in the plant has been awarded to Otto Wetstein, Jr., of LaPorte, Ia., who will begin work immediately. The plant is estimated to cost not less than \$100,000.

COLUMBUS, NEB.—The Platte County Independent Telephone Company has just been organized at Columbus with a capital stock of \$15,000.

CAMBRIDGE, N. Y.—The Buskirks and South Cambridge Telephone Company, of Cambridge, has been incorporated with a capital stock of \$4,000; directors, Charles King, E. B. Chase, and W. C. Chase, of Buskirks Bridge.

ELLICOTT, N. Y.—The Kiantone Co-operative Telephone Company has been organized for the purpose of constructing and maintaining a co-operative telephone line in the towns of Kiantone, Ellicott and Carroll. The members of the company are Alonzo J. Martin, Guy W. Carter, Geo. W. Fuller, Ernest R. Woodward, Allen Gould, Alexander Woodward, Alonzo Halladay, Myron A. Fish and Elhanan W. Bucklin, Jr. The officers are: President, Alonzo J. Martin; secretary, Elhanan W. Bucklin, Jr., and treasurer, Guy W. Carter.

NIAGARA FALLS, N. Y.—The Niagara County Home Telephone Company, of Niagara Falls, has been incorporated to operate in Erie and Niagara Counties, and Province of Ontario; capital, \$130,000. Directors: Wm. R. Campbell and Walter P. Horne, Niagara Falls, and Samuel B. Rawson, Elyria, O.

ONEONTA, N. Y.—The Oneonta Telephone Company, of Oneonta, has been incorporated, with a capital of \$10,000. The directors are E. W. Elmore, William H. Smith, F. J. Ives, W. W. Capron, J. F. Thompson, G. E. Moore and M. C. Heinstreet, of Oneonta.

SHELBY, O.—The Shelby Local Telephone Company, Shelby, has been incorporated, with a capital stock of \$75,000.

CUSTER, OKLA.—The Custer City Telephone Exchange and Extension Company, of Custer, has been incorporated for twenty years, with \$5,000 capital stock. The incorporators are C. H. Dean, G. A. Noble, J. C. Storm and T. H. Lindsey.

BURNS, ORE.—The business men of Burns have organized a company to build a telephone line from Burns to Prineville, and thence to Ontario. The stock is all owned by the business men of Burns and Prineville. The company expects to have the new line in working order this fall.

CONNELLSVILLE, PA.—The Connelleville Conduit Company, Connelleville, has been incorporated for the purpose of constructing and maintaining a system of conduits in Connelleville and its suburbs, for running and stringing telephone, telegraph, electric light, electric railway and other wires through the system; capital, \$1,400. Directors: A. D. Soisson, R. Marietta, Edwin K. Dick, Linford F. Ruth, Clair Stillwagon, J. V. Gray, Connelleville; William Dull, Dunbar.

HAMPTON, S. C.—The Hampton Telephone Company, of Hampton, has been incorporated, with a capital stock of \$280.

COLLIERSTOWN, VA.—The Rockbridge Telephone Company, with the principal office at Colliertown, Rockbridge County, has been granted a charter. The officers are: President, A. S. Montgomery, of Colliertown; secretary and treasurer, Major Adolph Elhart, of Murat, formerly of Baltimore.

WELCH, W. VA.—The Welch-Williamson Telephone Company, of Welch, has been incorporated, for the purpose of constructing and operating a telephone line between the town of Welch, McDowell County, and Williamson, Mingo County, and intermediate points. Authorized stock, \$25,000; subscribed, \$500; paid, \$50. Incorporators: W. J. McLoren, James A. Henchey, Edgar P. Rucker, W. S. Dangerfield and Ralph E. Hainer, of Welch, W. Va.

MOUNT HOREB, WIS.—The Mount Horeb Independent Telephone

THE WEEK'S MESSAGES Continued

Company, of the village of Mount Horeb, Dane County, has been incorporated, with a capital stock of \$25,000. Incorporators: Frank E. Bell, Martha E. Bell, J. N. Dahlen and L. H. Taylor.

Legal

KANSAS CITY, MO.—City Counsellor R. J. Ingraham will have an ordinance introduced in the Council authorizing and directing him to proceed against the Missouri & Kansas Telephone Company, to force it to accept \$60 for business and \$36 for residence telephones in accordance with the recently passed ordinance of the Council. The company will be made the defendant in a mandamus proceeding, and all private citizens who will aid the city in its fight are to be made plaintiffs with the city without cost to them. The plan is to have them tender the company the new rate, and if it refuses to accept the money it will be restrained by injunction from removing the telephones, and the users will become parties to the city's mandamus suit.

Financial

MARENGO, ILL.—The McHenry County Telephone Company, of Marengo, has increased its capital stock from \$2,500 to \$10,000.

DES MOINES, IOWA.—The telephone assessment of the State amounts to \$1,542,927.44. This is a quarter of a million higher than the assessment of the preceding year.

BAITIMORE, MD.—The Western Maryland Telephone Company, the Independent system being installed here, with connections throughout the Georges Creek mining region, has executed a mortgage for \$75,000 in favor of the Interstate and Guaranty Company, of this city, which will float the bonds of the telephone company.

BOSTON, MASS.—The directors of the American Telegraph and Telephone Company have declared a regular quarterly dividend of $\frac{1}{2}$ per cent., payable October 15, to stock of record September 30.

ADA, O.—The Ada Telephone Exchange Company has increased its capital stock to \$100,000.

NASHVILLE, TENN.—The Cumberland Telephone and Telegraph Company has declared a quarterly dividend of $1\frac{1}{4}$ per cent, payable October 1 to stockholders of record September 20.

SHERMAN, TEX.—The Grayson County Telephone Company has increased its capital stock from \$150,000 to \$170,000.

SPOTTSYLVANIA COURT HOUSE, VA.—The Spottsylvania Telephone Company has declared a dividend of 6 per cent.

Franchises

DECATUR, ALA.—The Southern Construction and Telephone Company, of Toledo, O., will make application for a franchise of the Decatur and New Decatur City Council for the purpose of putting in a telephone system in both towns.

DE LAND, FLA.—An ordinance has been passed granting to M. G. Rowe, of Starke, a franchise for the erection of a telephone system here. He deposited a cash forfeit for its completion within a year.

DAYTONA, FLA.—Rowe & Co., of Daytona, have been granted a telephone franchise, its lines to be in operation within twelve months.

CANTON, ILL.—Three telephone companies have asked for franchises here.

ANN ARBOR, MICH.—The new telephone company, of which S. B. Hutchinson is the promoter, has been granted a franchise here.

LONG BRANCH, N. J.—The Monmouth Telephone Company has been granted a franchise to erect a line from Manalapan to Milhurst.

LE ROY, N. Y.—The Intercean Telephone and Telegraph Company has been granted a franchise by the Board of Aldermen. The company was represented by B. T. Hubbell, Martin Carey and John B. Nolan, of Buffalo. Two of the considerations under which the franchise was granted were that the telephone company furnish a fire alarm system for the village. Seven boxes in different parts of the town will be connected with the central office. The other is that some of the wires be put under ground. Work will be commenced within 60 days, and the system will be in operation within six months.

GOLDSBORO, N. C.—The Southern Bell Telephone Company has been granted a franchise for a local and long-distance exchange here.

YOUNGSTOWN, O.—The Bell Telephone Company has asked that the company be given a franchise here.

MAUCH CHUNK, PA.—The Carbon Telephone Company has been given a franchise to construct and operate a telephone system in East Mauch Chunk.

Elections

NOKOMIS, ILL.—The stockholders of the People's Mutual Telephone Company, of this city, have organized a local board, with the following

officers: Dr. W. C. Hovey, president; W. P. Hagthorn, secretary and treasurer; H. J. Bender, director three years; Dr. G. S. Wilson, director two years; Frank Yackle, director for one year. The work of putting in the line will begin as soon as the poles can be secured.

DECATUR, IND.—The annual stockholders' meeting and election of a new board of directors for the Citizens' Telephone Company failed to stir up sufficient stockholders to make a quorum, and in consequence no election was held. In accordance with the by-laws of this company, the old board held over for another year. It is composed of James T. Merryman, F. M. Schirmeyer, Jeff Bryson, John D. Hale and E. X. Ehinger. The stock is advanced from the original formation price of four shares for \$40 to about \$175. The business of the company has grown with marvelous rapidity. Besides owning exchanges here and at Berne, they also have toll lines with stations at Geneva, Linn Grove, Magley, Williams, Poe, Monroe, Peterson, Prebie, Hoagland and Sheldon.

IRONTON, O.—The stockholders of the Lawrence Telephone Company have elected the following officers: Mr. Seaton, of Ashland, president; J. L. Anderson, vice-president; F. E. Hayward, secretary; Messrs. John Russell and J. Putnam, directors, in addition to the officers.

Combinations

FRISTOE, MO.—John Antwiler, of Fristoe, has purchased the telephone line between Warsaw and Cross Timbers.

CRESTLINE, O.—The Crestline Local Telephone Company has been organized, taking over the assets and business of the Crestline Telephone Company. The new company becomes in its business affairs a constituent of the Local Telephone Company of Norwalk, O., and a part of its system embracing the Independent telephone plants in Huron, Richland, Erie and part of Crawford and Seneca counties. The syndicate that is promoting the new organization is headed by J. F. Laning, of Norwalk. They will at once put \$10,000 into new work, and have provided a reserve in addition, in case it is needed for further development. The directors of the new company are Jacob Babst, J. F. Laning, C. R. Callaghan, Frank A. Knapp, J. F. Morkel, A. H. Kinsey and J. H. Beattie. The officers are Jacob Babst, president; C. E. Stine, secretary, and J. H. Beattie, treasurer. C. R. Callaghan, of Bellevue, the general manager of the plants of the Local Telephone Company, will be the superintendent of the plant.

Underground

ALTOONA, PA.—The Pennsylvania Telephone Company has completed the work of laying the conduit system, which involved the digging of 6,248 feet of trench, in which was laid 43,535 feet of terra cotta conduit and 1,162 feet of iron pipe, making a total of 44,787 feet, or 8.52 miles. This will accommodate twenty-eight cables of 200 pairs each, or a total of 11,200 wires. Twenty-two man-holes were also put in.

NARBERTH, PA.—The Borough Council has granted the Delaware and Atlantic Telephone Company the right to open the borough streets to lay its wires underground.

CHARLESTON, S. C.—The work of placing the telephone wires underground will begin early in October. The work was to have commenced some time ago, but the delay has been caused on account of the Bell Telephone Company being unable to get the material.

Construction

COLUMBUS, GA.—It is announced that work on the Columbus Automatic Telephone Company's system will be commenced immediately. Wires in the business districts will be laid underground.

TERRE HAUTE, IND.—The Citizens' Telephone Company will install a 600 drop switchboard in its new branch exchange.

BUFFALO, N. Y.—The Buffalo, Rochester & Pittsburg Railway Company is installing a telephone system to extend along the entire line.

BUFFALO, N. Y.—The Century Telephone Company is extending its lines to Bath from Corning, and an exchange will be established at Bath. An office has been leased at Bath and subscribers for the system are now being solicited.

COLUMBUS, O.—The Columbus Citizens' Telephone Company has concluded a contract for the installation of an automatic telephone system, with an immediate capacity of 7,000, and with an ultimate capacity of 19,000 main line telephones. The company will purchase real estate and erect a building for the use of the new exchange.

DELAWARE, O.—Linemen are engaged in putting up 10,000 feet of telephone cable in different parts of the city, for the Citizens' Telephone Company. The company is rapidly getting its new exchange fitted up. A new switchboard with a capacity of 1,800 lines, is to be put in, with an ultimate capacity of 3,200 lines.

ALTOONA, PA.—The United Telephone Company is improving its service in Tyrone by placing all of its telephones in that town on central energy, the same as those in use here. The same company is constructing underground plants in Philipsburg and Clearfield.

THE WEEKS MESSAGES *Concluded*

DURBAN, SOUTH AFRICA.—The Durban Municipal Council proposes to establish a telephone exchange at an estimated cost of \$400,000.

RACINE, WIS.—The Citizens' Telephone Company of this city has decided to extend its lines to connect with Milwaukee, Madison, Appleton, Janesville, Oshkosh, Neenah, Menasha, Union Grove and other smaller towns on these lines. The company is being fought by the Wisconsin Telephone Company for territory.

ALHAMBRA, CAL.—The Alhambra Telephone Exchange is growing rapidly. The new switchboard is in place, and new cable attached. The line, which serves as a feeder for many lateral lines, has been extended to Garvalia, four miles south, and connections are being made daily.

PALMDALE, CAL.—Telephonic communication between Shoemaker and the Big Horn mine, on North Baldy Mountain, has been established, and the line is now in working order. Fred C. Fenner, general manager of the Lowell and California Mining Company, which owns the Big Horn, reports that the construction of the line from Shoemaker to Palmdale is now in progress. When completed the line from the mine to Palmdale will be a little over 33 miles in length.

ELKHART, IND.—It is expected by the management of the Chicago Telephone Supply Company that arrangements will shortly be perfected for commencing work in its new factory.

GUILFORD, N. Y.—Recently two telephone lines were constructed here, one connecting with Bainbridge, the other by way of Yaleville to West Bainbridge, connecting there with Oxford, Afton, Binghamton and all points south and west. A line connecting with Norwich has been thought of.

MECHANICSVILLE, N. Y.—The Saratoga Telephone Company has strung wires from Balston Spa to the river bridge. The company has leased the privilege of placing wires over the bridge, and the company's wires will enter Troy on the Rensselaer County side of the river.

PANAMA, N. Y.—The Panama Local Telephone Company has made a contract with the Ashville and Panama Telephone Company to connect with its lines at Panama. These lines connect with the lines of the Home Telephone Company of Jamestown and the Independent Telephone systems of all the nearby places.

JOHNSTOWN, PA.—At a meeting of the subscribers of the Indiana branch of the Farmers' Telephone Company, held at Indiana, a permanent organization was effected by the election of the following officers. President, Frank Douglass; treasurer, A. S. Cunningham; secretary, J. A. Crossman. There is every indication that the lines of the company will be extended to Indiana and an exchange established. Already over 70 of the business men and citizens of the town are subscribers.

WYALUSING, PA.—The Bradford County Telephone Company will probably enlarge its system and bring the line down the river to Wyalusing, with the ultimate intention of continuing southward to Laceyville, where a connection will be made with the Pittston Independent system, thus giving the Bradford County company a southern outlet into the Wyoming Valley and thence to Philadelphia.

NASHVILLE, TENN.—The Cumberland Telephone and Telegraph Company has issued the statement of its business for the month of August, 1902, and the growth of the company is shown as follows

Number of subscribers August 1, 1902.....	85,318
Added during month	3,845
Discontinued during month.....	2,940
Net increase for month.....	905

Total number subscribers August 31, 1902..... 86,223

SHERMAN, TEX.—The Indianola Telephone and Telegraph Company has filed an amendment to its charter, changing the location of its general offices from Sherman to Beaumont, and extending its field of operations.

GRANTSBURG, WIS.—Arthur C. Bowe, general manager of the Consolidated Telephone and Telegraph Company, of Minneapolis, has secured about forty subscribers to a local exchange in this village, and will put the telephones in immediately. The company intends to run lines east, connecting with the country stores.

Personal

TERRE HAUTE, IND.—F. B. Sabin, formerly with the Chicago Telephone Company, has accepted a position as superintendent of the Citizens' Telephone Company, succeeding V. Ray. O. J. Dorwin, wire chief for the Citizens' company, has resigned, and Joseph Herbert, formerly with the American Electric Company of Chicago, has been selected to fill his place.

COHOES, N. Y.—A. Scanlon has been appointed manager of the Home Telephone Company in Cohoes and Waterford.

NEWBURGH, N. Y.—George C. Otis, formerly of Middletown, has accepted the position of general manager of the Colonial Telephone Company of this city.

TRADE NOTES

THE VOUGHT-BERGER COMPANY, makers of switchboards and telephones, LaCrosse, Wis., have just moved into new quarters. The manufacturing plant of the company now includes three buildings with a floor space of 20,000 square feet. The plant is now probably one of the largest of its kind in the country. Among the recent switchboards and complete exchange equipments put out by the company, may be mentioned the following: Western Wisconsin Telephone Company, Arcadia, Wis.; Keister Telephone Company, Keister, Minn.; Alexander Telephone Company, Alexander, Ia.; LaCrosse Telephone Company, (toll board), LaCrosse, Wis.; People's Telephone Company, Houston, Minn.; Walnut Grove Telephone Company, Walnut Grove, Minn.; Farmers' and Merchants' Mutual Telephone Company, Le Seur and Rush River, Minn.; Harris-Jewel Telephone Company, (Pendant telephones used exclusively), Coon Rapids, Ia.; Victor Mutual Telephone Company, Harvey, Ia.; Havelock Telephone Company, Havelock, Ia.; Davis Telephone Company, Goodwater, Ala.; and the Golden Rod Telephone Company, Mead and Ceresco, Neb.

The former superintendent and purchasing agent of the Western Telephone Construction Company, Mr. D. T. Foley, has recently accepted a similar position with the VOUGHT-BERGER COMPANY.

PLANTS FOR SALE

FOR SALE—One of best equipped telephone exchanges in Kansas; price, \$22,000; upon which amount plant now NETS 23 per cent. If you mean business, address X for particulars, care of AMERICAN TELEPHONE JOURNAL, New York.

TELEPHONE PLANT FOR SALE—160 telephones, 100 miles of toll lines; excellent opportunity for extending business; will sell for \$12,000; pays 15 per cent. net on this amount. Address TELEPHONE CO., care of AMERICAN TELEPHONE JOURNAL.

WANTED

POSITION as foreman or superintendent with telephone or construction company. Twelve years' experience in telephone construction work; best references furnished. Address J. W. S., care AMERICAN TELEPHONE JOURNAL, N. Y.

POSITION in an exchange of 100 to 500 subscribers, as manager or assistant manager. Experienced in construction and switchboard work; references furnished. Address EVAN PAUL JONES, North Vernon, Ind.

EXCLUSIVE handling of an account, for Chicago trade, beginning January 1st. Manufacturers Agency basis. Address SALESMAN, care AMERICAN TELEPHONE JOURNAL, Monadnock Building, Chicago.

STEADY position as troubleman. Thoroughly understand switchboard, line and instrument work; five years' experience. Address C. R. SAVAGE, Lebanon, O.

EXPERIENCED telephone traveling salesman; acquaintance with Northwest trade preferred, but not essential. Address THE VOUGHT-BERGER COMPANY, makers of telephones and switchboards, La Crosse, Wisconsin.

POSITION by a competent and experienced salesman of electric light, telephone and street railway material, by a young man with 14 years' experience in this business; best of references. Address L. C., care AMERICAN TELEPHONE JOURNAL.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISSELL CO., Toledo, Ohio.

POSITION as manager or superintendent of small exchange; at present in charge of small exchange; 31 years old; married; strictly temperate; references furnished. Address A. B. C., care AMERICAN TELEPHONE JOURNAL.

The American Telephone Journal

VOLUME VI

SATURDAY, OCTOBER 4, 1902

NUMBER 14

A PROSPEROUS MINNESOTA COMPANY.

By J. H. JAMES, M. D.

THE Mankato Citizens Telephone Company, of Mankato, Minn., was organized in March, 1898, for the relief of the telephone users of the city from the exactions and the poor service of the Northwestern Telephone Company, licensee of the Bell, and to aid the Independent movement in South and Southwestern Minnesota which had many exchanges and were building toll lines towards us in competition with the Northwestern Company, two of which had already entered our city and wanted exchange connection. The Northwestern for 12 years had a complete monopoly of the territory and an exchange in the city with 140 subscribers only, but with rates for service which were considered prohibitory for any but the well-to-do, who could afford to pay for a luxury, and a poor one at that, considering the character and kind of service furnished.

No sooner had the Citizens' Company gotten well organized, and begun the construction of its plant, encouraged by the promised aid and support of the Independent companies interested throughout the territory, than the Northwestern Company purchased its competing toll lines and made long term contracts with them to connect with its exchanges and to abstain from further entering its territory for toll business, thus smothering all Independent competition in toll construction within the territory covered by its Northwestern lines and leaving us alone to compete with it on its own ground with no hope of outside service or assistance whatever.

Not content with thus punishing our impertinence in daring to enter the local field so long appropriated by it, this company then began to renovate its plant—long before urged by the public—changed their almost useless and wornout transmitters, and promised every subscriber to its business telephone a residence telephone free of charge, providing they would retain their business telephone.

It also canvassed the entire city, and offered to place residence telephones at 50 cents a month in order to compel the retention of as many business telephones as possible, and added continuous service, which up to this time it had never done, although the city numbered 12,000 people.

By these means it was able to retain many of its old subscribers and to increase its subscription list quite materially. It thus confidently expected to crush out forever any budding enthusiasm in the new enterprise and to sound a permanent warning to all Independent telephone aspirants to keep off its territory.

Is it any wonder that with this example of its resources and power, that the people stood aloof at our venture and that they believed without question the statements of the agents of the Bell interests that it was impossible for us to live?

Is it any wonder that those who had subscribed and invested in the new enterprise under such flattering prospects and promise of relief from their burdens should feel that it had been a fruitless venture, and that some were glad to dispose of their interests at any figure?

Before we had begun the erection of our exchange we had, however, secured 200 five-year contracts, and a few of the directors still having some faith in the enterprise, themselves and the people, put their hands in their pockets and fished up the remaining \$5,000 necessary to complete the \$10,000 plant they had contracted for when there was no other money to be had for it.

In February, 1899, the exchange was opened with 100 telephones installed and before the plant was completed so superior was the service to that of the Northwestern that we had 250 subscribers at \$2.00 per month for business and \$1.25 for residence. This increase has gone steadily on exceeding every limit we have set until we have thrice had to increase our switchboard, and string additional cables until our poles will

no longer with safety permit additional increase, and we are now completely renovating our plant and the enemy practically stand aghast at our success despite its efforts.

We now have 615 telephones installed in the city and cannot meet the constant demand until we shall have finished the rebuilding. We have built within the past year an exchange at Mapleton, 24 miles southeast in the same county with nearly 100 telephones installed, and, connecting with several farmer lines in the vicinity. We have built nearly 60 miles of toll and farmers' lines connecting with the parent exchange and intermediate villages as well as in other directions from our city and are still contracting and building such lines.

We have increased our capital stock from \$25,000 to \$100,000, and have now issued and have subscriptions for \$50,000 of our stock at par among the old stockholders, as we need the money for additions and improvements.

With the excellent service which we have given and the courteous treatment of our employees, in marked contrast to that received before we entered the field and the rapid increase in subscribers we have had, confidence in us has returned until we have no reason to be anxious for funds to project our work. We are at present in the midst of a complete remodeling of our exchange, placing our cables under ground, erecting an exchange building at a cost—including the ground—of \$12,000 with a switchboard of the Stromberg-Carlson central energy lamp signal type and an ultimate capacity of 1,600 lines. We expect soon to have copper trunk lines connecting us with the Twin City exchanges in Minneapolis and St. Paul as well as all intermediate towns en route, and this with our own toll and connecting lines, and the new central energy system in complete operation, makes us feel that we are on the road to complete success both from a business and a financial venture, and can hold our own with the stronger rival interests here.

We have no bonded indebtedness to meet, and we can declare a dividend or not, as the circumstances move us, but we have thus far from the first, paid regular dividends and our stockholders and others now stand ready to back us with any amount of funds required. Every dollar of our stock issue has been paid for at par. We have had numerous opportunities to dispose of new issue at a good premium, but our directors, wisely I think, have decided to give it to the original holders so long as they desired to increase their holdings at par, rather than sell to those who took no chance with us until the enterprise was on a paying basis. Our stockholders are for the most part business men in the city, and we have paid back to them in dividends 61 per cent of their first purchase in three years.

This in brief shows what can be done by the united effort of an Independent telephone company in opposition to the Bell interests, even in their own stronghold, when a majority of the people are with us and the business is economically and honestly managed. Had we been experienced telephone men in construction or had we for a moment dreamed that we would ever reach our present number of subscribers, we could have saved much that will have to be sacrificed in the rebuilding so soon.

Up to the present it has not been found necessary to increase our rates, but it will probably be so when our present remodeling is completed, and it is then that the rivals expect to score another victory, but our new contracts are all drawn with this provision and it has no deterring effect in our getting subscribers thus far, and with our superior service and increased advantages which grants free service between all city and interurban subscribers within a radius of 12 miles or between switching stations, we do not contemplate any very great falling off in our subscription list.

REVIEW OF THE PHILADELPHIA SITUATION

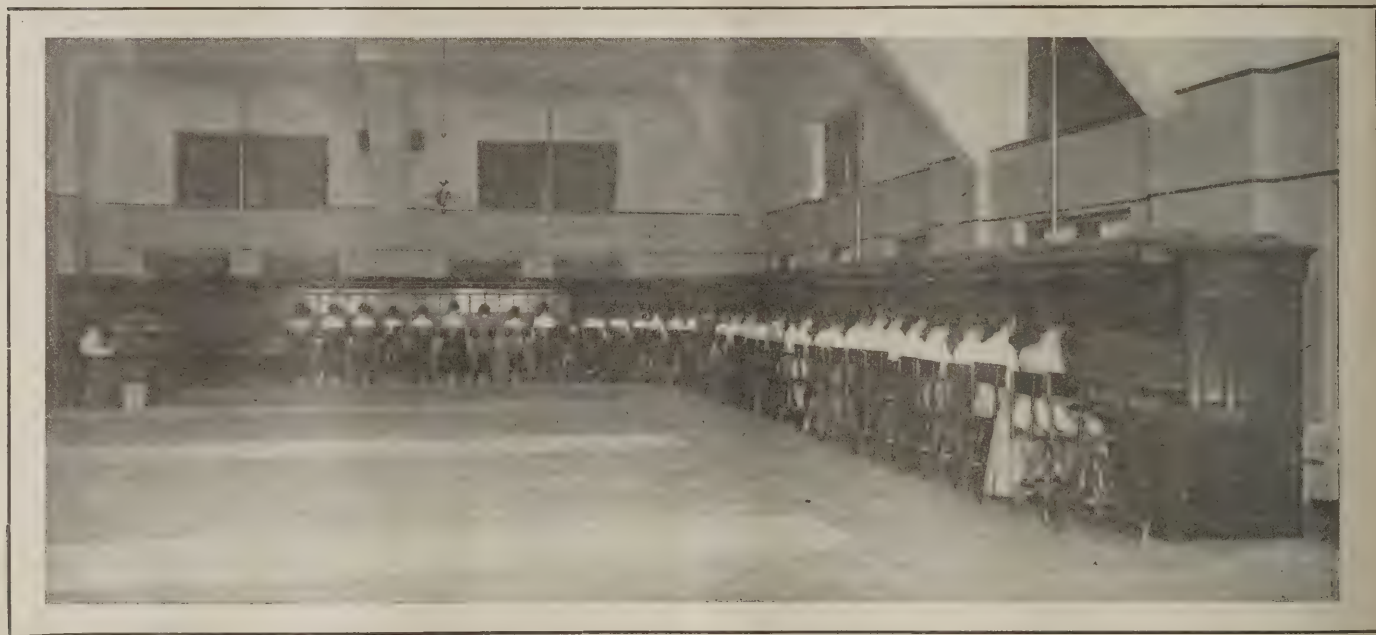
PHILADELPHIANS just now are much interested in the outcome of the war being waged on the Bell Telephone Company's former monopoly by the Keystone Telephone Company, the new Independent concern, which has recently commenced giving service in that city. Judging from the present outlook, it is the consensus of opinion that, in a year or a little over, the Bell Telephone Company will find itself on a foundation of shifting sand.

In other cities where the Independents have operated in competition with the Bell it has been the latter which took the initiative in the fight. And, although in the end the newer system has always bore the brunt of the fierce competition of its powerful antagonist and continued to operate successfully, the Bell was always the aggressor. The situation in Philadelphia, therefore, is distinctly unique. There the Independent company has and is now taking the initiative in the fight which is inevitable in a city with competitive telephone systems. The Keystone Company is expanding and growing and reaching out, and is daily adding to its special features and subscription list.

The only cognizance the Bell Telephone Company has taken of the entry of the Keystone Company into the Philadelphia field was what was intended to be a reduction of rates. The

As has already been pointed out, the Bell telephone service in Philadelphia is not what it should be—not what is expected by its patrons when they pay a large sum each year for the service. The causes of this poor service are obvious. In the first place the system of the Bell in Philadelphia is very old, being one of the earliest exchanges operated by the parent company. It was built only for a small capacity—for the number of immediate subscribers expected. As the number of subscribers grew the system had to be added to and increased. Gradually new exchanges were established, new conduit systems installed and new pole lines erected. This resulted in a very much patched up system, which is still the condition, and cannot be overcome without the entire rebuilding of the system. On account of the enormous cost and the confusion resulting from such a vast undertaking, this the Bell company will not do. Its system will then remain in the complicated and complex condition it now is, only it will become more and more confused with increased growth.

In the second place, the large number of exchanges which are required to handle the business under the present arrangement is a very serious drawback to a good, prompt and efficient service. There are now in Philadelphia sixteen separate exchanges operated by the Bell. By this arrangement almost all calls have to be transferred from the receiving exchange to



MAIN EXCHANGE OF THE KEYSTONE TELEPHONE COMPANY. THE OTHER FIVE WILL BE UNIFORM.

Bell now has no fixed rates. Where possible, it demands extortionate rates and in other cases gives almost any rates demanded. It has party line rates, and message rates, and flat rates, and special rates to special parties, and all on a fluctuating scale. These attempts at rate reduction have simply played into the hands of the Keystone Company. The large user of the telephone who was forced to pay high for service, kicked; the small user who paid a small sum but received a correspondingly low class of service, kicked; the party liner, whose connections are almost always slow and difficult, kicked; and this attempt at rate reduction on the part of the Bell consequently resulted in nothing but dissatisfaction and disgruntled customers.

On the other hand, the Keystone Company charges a fixed rate, both for residence and business telephones; its lines are all exclusive; its service the best and most up-to-date that money could procure; its trunk lines amply sufficient to take care of the business, and its operators well trained and well disciplined, polite and courteous. Telephone users in Philadelphia are comparing the two services, and the result is that the Keystone Company is not only getting subscribers who were not telephone users before and putting its telephones alongside the Bell telephones in many places, but in hundreds of instances it is actually supplanting the service of its older rival.

the exchange to which the called subscriber is connected. This naturally makes connections exceedingly slow, and, because its trunking facilities are entirely inadequate, almost always very difficult to get.

And third, the system of designating stations used by the Bell makes its service very unpopular. The sixteen exchanges are known respectively as 1, 2, 3, 4, etc., up to 16. A subscriber, for instance, looks in the book and finds that the party he wants is "No. 3-39-23." This is pretty bad, and in many cases either the calling party or one of the exchange operators forgets the number. In such a case the subscriber must needs again look in the book, and the number may even again be forgotten. The number above is not the worst, either. Take such a one as this, for example, "No. 13-34-79," or, if it is a party line, "No. 13-74-39 b," and it will be understood that Bell telephone users in Philadelphia frequently lose their religion.

Still another handicap to good service that confronts the Bell people is the large area of pole lines still in use there. It has been shown many times in the *AMERICAN TELEPHONE JOURNAL* that good telephone service, in the case of a large system, cannot be given where pole lines are extensively used. When the Bell company put its lines underground in Philadelphia it did not provide for the large growth that has come. The conduit system was long ago swamped, and, although some new con-

duits have been built, still a large proportion of the Bell lines are aerial, either cable or open wire.

These are only a few of the difficulties in the way of a good Bell telephone service in Philadelphia. There are many others, but the above will suffice to demonstrate the fact. And about the only remedy would be a complete rebuilding and reconstruction, which would entail such a large expenditure and be so very difficult that it may be placed in the category of impossibilities.

During the last six or seven years it has been shown that a good service is the very best competitor. The Bell company in Philadelphia could not better its service, so it made the other move frequently resorted to—a cheapening in the price of its service. And with what disastrous results has already been shown.

When completed the system of the Keystone Company will have six exchanges, each with 5,000 present equipment and 10,000 ultimate capacity, or a total of 30,000 present equipment and 60,000 ultimate capacity. The Bell Telephone Company has about the same capacity, but to take care of this number it has sixteen exchanges, against the six of the Keystone Company. Of all calls to the Bell exchanges, therefore, about 80 per cent have to be transferred over the trunks between exchanges, while less than half this percentage of Keystone calls would require trunking on the average.

The method of numbering stations is also much simpler under the Keystone system. The exchanges will each be known by a name; for instance, Main, Race, German, East, etc. All that is necessary is to say "Main 837" or "Race 439." This is an arrangement greatly appreciated by the Philadelphians, who have been accustomed to the jaw-breaking and brain-wasting station designations under the Bell regime.

By these comparisons it can readily be seen how the Keystone Company is making serious inroads into the business of the Bell. The Independent concern has a good reputation in Philadelphia and the sympathy of the people. It now has between 12,000 and 13,000 subscribers on its list, although so far only about 7,000 have been connected. The connections are being made as rapidly as possible, however. Three of the six exchanges are completed and in operation. The other three are under construction, and, it is expected, will soon be ready for opening. It is confidently asserted by the Keystone officials that inside of two years these exchanges will be filled and new ones will have to be provided. From the way new patrons are being received, it certainly looks that this assertion is based on solid facts. An illustration was given showing how the Keystone was getting Bell subscribers.

A business man who had both the Bell and Independent telephones in his office, but only a Bell instrument in his home, decided not long ago to take a day off from work. Wishing to notify his office of this fact, he called up on the Bell telephone. But the office instrument was out of order and the connection could not be secured. Remembering, however, the Information Bureau run by the Keystone, and knowing that they had a Bell telephone, he called up the Information Bureau and asked them to communicate with his office, stating that he would be absent that day. The Bureau of Information, of course, did this, and at once made a friend of the business man. He had the Bell instrument removed from his home and a Keystone substituted. And, naturally, this man told all his friends and acquaintances of the good service given by the Keystone Company, which is the best kind of an advertisement. This is only a single instance; there have been hundreds of like cases since the Independent company started operating in Philadelphia.

The Keystone Company is also going after the private branch exchange business of the Bell company, and with remarkable success. This is probably the most severe blow to the Bell company, for it is this class of service that pays bet-

ter than any other. Within the past three months the Keystone has captured over 50 of these private exchanges, the Bell exchange in every case being dispensed with. Perhaps the most important of these contracts is that for an exchange in the Philadelphia Stock Exchange, which was announced recently in the AMERICAN TELEPHONE JOURNAL. The prestige gained by this contract will be of inestimable value. The system to be installed will be the most rapid and up-to-date possible.

The exchange will be located in a room adjoining the Stock Exchange trading room. Around the wall will be the usual telephone booths, numbered consecutively from one up. Every member of the stock exchange will install a Keystone telephone in his office, which will be connected to the private branch exchange. If, for instance, a broker wants to talk to his office, he comes into the branch exchange room, shouts the number wanted and also the number of the booth he enters. By the time he enters the booth the operator has the connection established. And there her duties end until the conversation is at an end, for in each booth there is a special ringing key, by which the broker rings his own connection. This gives the time of the operator to looking out for other connections. If the office wants the broker the operator connects with one of the booths. Before her are numbered push-buttons, and each broker has a number corresponding with the number on one button. If she wants, for instance, Broker "20," she presses button "20," which causes a gong to be rung in the trading room, and on the wall automatically is displayed "20" in large figures. No. 20 knows he is wanted at the telephone, and rushes into the other room. The operator then shouts the number of the booth, and in a few seconds he has connection with his office.

While this contract is one of the most important, there are others just as large which the Bell has lost. Only this week a contract was given by the Quaker City Cab Company for a branch exchange with 40 circuits and probably 40 telephones on a circuit. These telephones will be placed in hotels, theaters, clubs, and other places from which cab calls are frequent.

The Book Lovers' Library, which operates in many cities in the country, with headquarters in Philadelphia, is another large contractor. All the different city branches of the library are connected with the branch exchange. There are nearly 75 telephones connected with this exchange.

John Wanamaker's department store has a private exchange with 60 stations, connecting all departments. The Philadelphia North American has an exchange with 60 stations; the Philadelphia Inquirer, 25 stations; Atlantic Refining Company, 75 stations, and many other prominent business houses in the city that formerly had Bell private exchanges already have the Keystone private branch exchanges in operation or have contracted for them.

One serious drawback to the success of the Keystone Company thus far has been its lack of long-distance service. But in a short time splendid long-distance facilities will have been completed. The Keystone State Telephone and Telegraph Company, which is the long-distance branch of the Keystone Telephone Company, is building lines all over the Eastern part of Pennsylvania. The toll board was to have been opened the first of this month, but has been delayed considerably by unforeseen contingencies. It will be in operation, however, in two or three weeks.

Traffic arrangements have been entered into with the Interstate Telephone Company of New Jersey, which practically covers that State; the Consolidated Telephone Company and Standard Telephone Company, which cover nearly all of Pennsylvania, and the Maryland Telephone and Telegraph Company of Baltimore, which covers Maryland and Delaware, so that the Keystone will soon have a very large circle of long-distance connections.

INTERSTATE ASSOCIATION CONVENTION

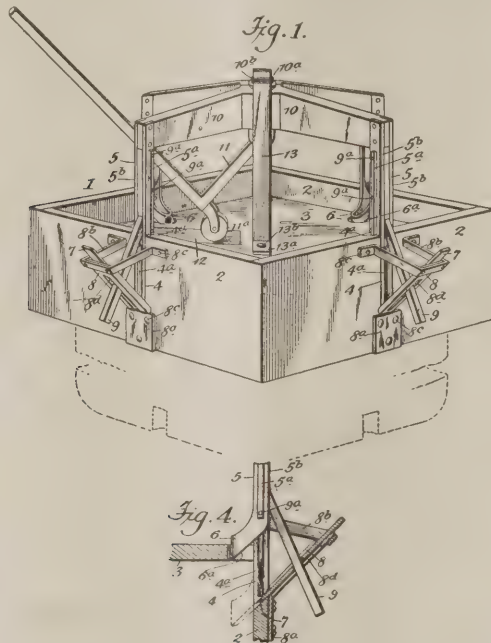
THE next convention of the Interstate Telephone Association will be held at Chicago, December 9, 10 and 11. This was decided at a special meeting of the officers and executive board held in Chicago to discuss plans, arrange details, fix up a programme, etc.

A special committee was appointed to arrange for the enter-

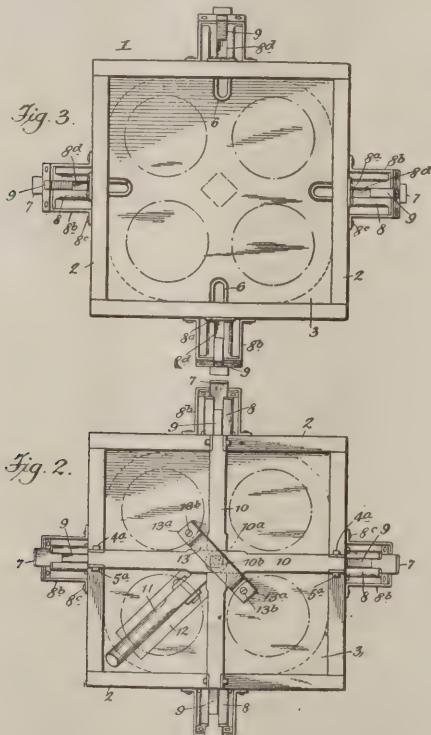
tainment of the members and guests of the association. Full particulars of all these plans will be disseminated in circular form through the nine States embraced in the association in the near future. The AMERICAN TELEPHONE JOURNAL is assured that the meeting called for December will be the largest and most enthusiastic gathering of telephone men ever convened

Patents

Robert W. Lyle, of Perth Amboy, N. J., patents (No. 709,025, September 16, 1902) a machine for cutting recesses in conduit sections. The same inventor recently patented a method of building conduits in which the essential feature was the use of



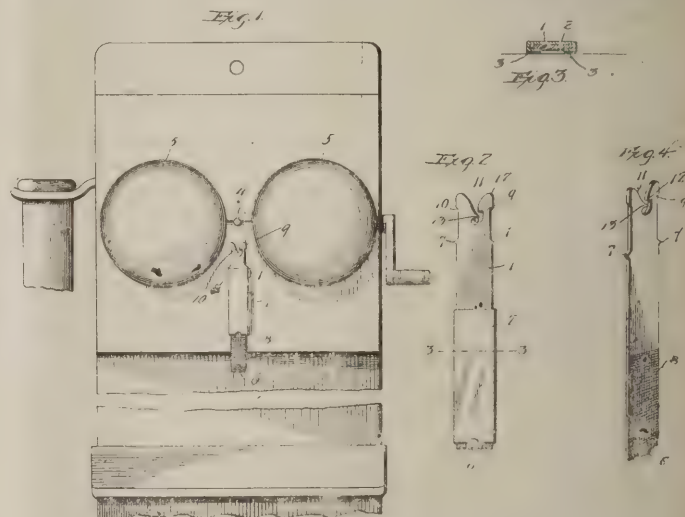
specially shaped grooves in the ends of the conduit sections by means of which, with the use of keys made to fit the grooves, an improved form of joint was obtained. The present patent covers a machine for making the specially shaped grooves in the



ends of the conduit sections. The machine consists of a frame 1 made of side pieces 2 to inclose the conduit section. A frame of cross-pieces 10 carries the knives for cutting the grooves 6 and the angularly inclined knives 7 for cutting through the end of

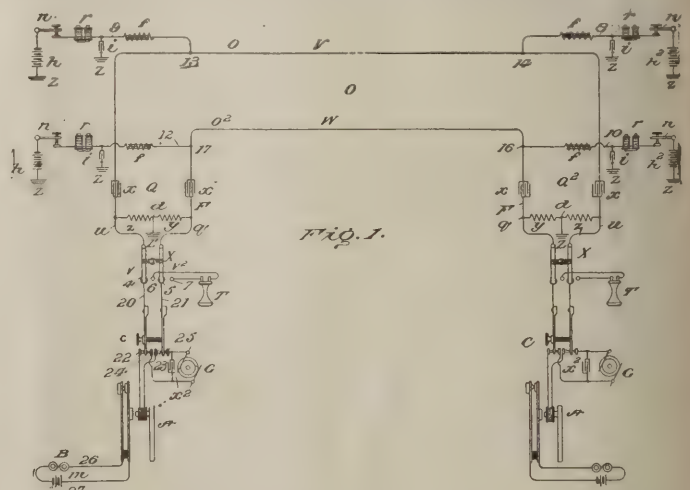
the core of cement gouged out by the curved knife 6 when the groove has been cut the desired length. The knife carrying frame is operated by the bent lever 11 attached to the point at which the cross-pieces 10 unite, the roller 11a of the bent lever 11 works on a track 4a forming a moving fulcrum so that when the outer end of the lever is thrown up the knife carrying frame is depressed and the groove cut, the angular knife 7 being pressed in by lever 9 to cut through the end of the core of cement cut out by the gouge-knife 6, the core, at the end of the operation, being enclosed between knives 6 and 7. Throwing the outer end of 11 downward then raises the knife carrying frame and the knives are withdrawn, the core of cement cut out of the groove being carried away by 6, from which position it is forced out at the next cutting operation.

Zeremba E. Jackson, of Atchison, Kansas, patents (No. 709,327, September 16, 1902) a telephone call annunciator designed as an attachment for any of the ordinary telephones to provide a signal when a call comes over the instrument. The special utility of the device is where a number of telephones are in use in the same office, the signal giving a positive indication of the instrument over which a call has come. Referring to the draw-



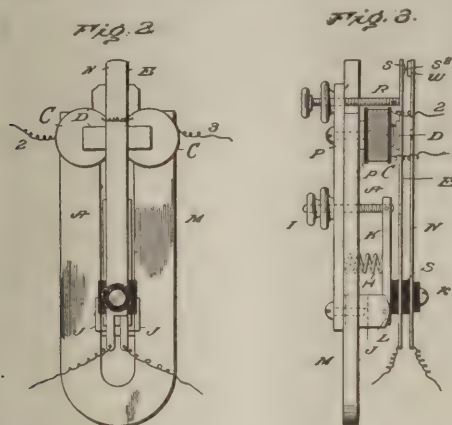
ings the signal consists of a metal strip 1, sliding in a flat tube 2 attached to the bell box. The slide has shoulders 7 to prevent it from falling through the tube and a lug 6 to prevent it from being pulled out from the top. The top of the slide is formed into a latch 13 by means of which it is hooked over the shaft of the bell-hammer. When the hammer is vibrated it works itself out of the latch, allowing the slide to fall and so display the signal.

John M. Fell, of Arlington, N. J., patents (No. 709,437) September 16, 1902) and assigns to the American Telephone and

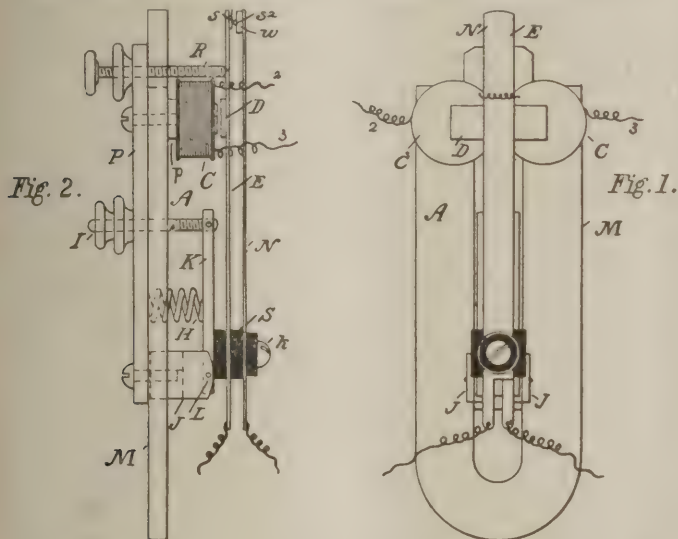


Telegraph Company, apparatus for a composite system of simultaneous telegraphy and telephony. This patent practically covers the same ground as that of the same inventor relating to a vibratory current relay specially designed for signalling on composite circuits. This patent was abstracted in the AMERICAN TELEPHONE JOURNAL last week and as the present patent covers

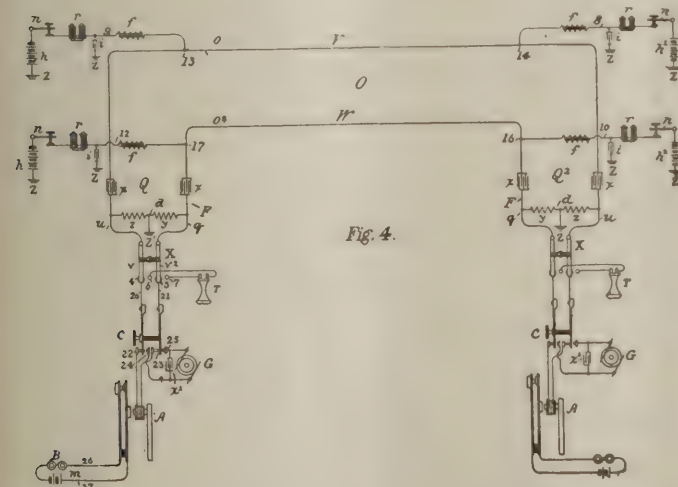
practically the same ground and is illustrated by identically the same drawings, no further description seems to be necessary.



John M. Fell, of Arlington, N. J., patents (No. 708,539, September 9, 1902) and assigns to the American Telephone and Telegraph Company a vibratory current relay designed to furnish means for signaling between the telephone stations of a composite telephone and telegraph circuit. The relay is adapted to respond to alternating currents of such strength and frequency as not to interfere with the telegraph instruments and op-



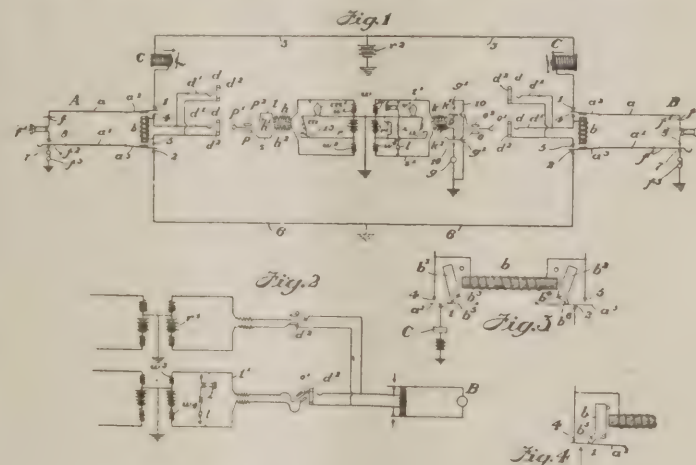
erates to open a local circuit containing an audible or visual signal. Referring to the drawings M is a V-shaped permanent magnet carrying coils CC and controlling armature D attached to spring-strip E. The strip E is attached to the insulating block S, which also carries a similar strip N having a weight w



at its free end; the strips N and S have at their free ends the plate and point s and s² which are the relay contacts and are normally closed. Just beyond the coils strip E bears on a screw-stop R by which the distance between the armature and the pole

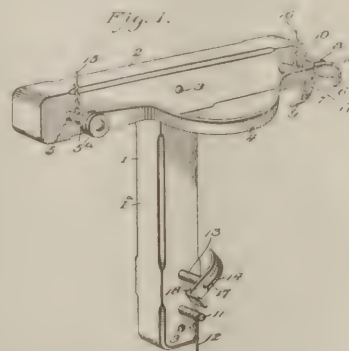
pieces of the magnet may be adjusted and which also serves to make a nodal point in E so that when thrown into vibration its period will be different from that of N. The two strips are adjustable as regards tension by being mounted on the plate K pivoted at L to the post J and adjustable against the pressure of the spring H by the set-screw I. When an alternating current circulates through the coils the armature is vibrated and as due to the weight w on the end of N and the nodal point in E caused by the stop R, the two springs E and N have different rates of vibration, the result will be to open the contacts ss² or so to diminish the pressure on them that they will be practically open, the signal in the local circuit will then be displayed. An alternating current of twenty volts and three hundred periods per second has been found best suited to operate the relay. Fig. 4 shows the relay used on a composite telegraph and telephone circuit designed by Mr. Fell and covered in a separate patent. The usual impedance coils f and condensers x are employed to prevent interference between the telegraph and telephone currents. The switch X serves to throw the telephone circuit from the talking apparatus T to the ringing key c. The key c normally connects the vibratory current relay A, just described, controlling the local circuit with the signal; on depressing c the relay is cut out and the special signaling current put to line from G, a condenser x² being bridged across G to smooth out the current.

F. W. Dunbar, of Chicago, patents (reissue No. 12,031, September 16, 1902) a telephone system in which the essential feature is that the cut-off relay switches the line from the line-signal to the jacks, the subscriber's line being normally connected



only to the line signal. This is a reissue of Patent No. 689,953, December 31, 1901, which was described and illustrated in the AMERICAN TELEPHONE JOURNAL for January 18, 1902, Vol. 5, No. 3.

Columbus B. McPherson, of Birmingham, Ill., patents (No. 709,351, September 16, 1902) a telephone switch by means of which a telephone may be thrown out of the main circuit during a severe electrical storm for the purpose of preventing the wrecking or burning out of the instrument. The design of the switch



is very simple and is clearly illustrated by the drawing. The line wire being attached to 5, the pivot of the switch, the telephone wire to 10 and the ground wire to 11 which is connected with 13, it is clear that the line wire may be disconnected from the telephone and connected to ground by the simple operation of turning the lever from one contact plate to the other.

Opinion and Comment

TIME IS MONEY

THE paper read by Mr. W. W. Dilworth at the Kansas State Convention on "The Enforcement of the Message Time Limit" reveals a somewhat distressing lack of good business management on the part of the telephone companies which have indulged in the practice of allowing their customers to use toll connections without strict measurement of the time. Nowhere is it truer that time is money than on a telephone toll line, and to sell toll telephone service without measuring accurately the time occupied by each connection and charging in proportion is as unbusinesslike as it would be for a butcher to sell a piece of beef for a roast at the same price as he would a small sirloin steak.

A telephone company that does business in this way, selling a ten or fifteen minute connection for the same price as a five or three-minute connection, is not only doing great harm to itself but is doing an active injury to other telephone companies, because it is teaching the customers whom it indulges with free service to demand the same unreasonable concessions from the owners of other toll lines with whom they may have to deal. Such unpractical laxness in measuring toll charges as Mr. Dilworth referred to is the poorest kind of bad business, for the reason that a toll line properly equipped and operated is an expensive piece of telephone plant to own and maintain and depends for a profitable revenue absolutely on payment in strict proportion to the time it is in service. Most telephone owners realize this perfectly and conduct their business accordingly. That there should be any exceptions is a serious reproach to the business capacity of those responsible for the irregular methods referred to in the paper under notice.

As we have frequently pointed the toll line business is a very important part of the telephone industry, and influences the general business in a variety of ways. Efficient and well operated toll lines, giving a quick service and good talking are one of the strongest aides to building up large local systems and are a great source of strength in knitting together many small local systems that otherwise would have a difficult struggle to survive. No branch of the business requires more energy, skill and scientific management than the building and operation of toll lines as by the toll line service they are able to render the public many local systems will eventually stand or fall. The public to-day demands an ample toll-line service, and, moreover, demands a much more efficient toll-line service than it now gets. The most enterprising telephone men in the field fully recognize this and are working accordingly and all telephone men should become convinced of the same fact. Such practices as those discussed by Mr. Dilworth are distinctly damaging to the proper development of the toll line business and cannot be too strongly condemned or too promptly repressed.

BELL METHODS IN OHIO

IN COLUMBUS, O., competition between the Bell Telephone Company and the Independent company is being waged with great bitterness just now. The Bell company is not satisfied with its low subscription list. Before the advent of the Independents it was entirely satisfied, and made no effort to give better service or secure new subscribers. But the fact has been brought home to it that it has a hustling, vigorous young rival in that city, and that this rival is in a fair way to gobble up all, or nearly all, the business in Columbus. So the Bell has decided it is about time for it to be up and doing. It has been stated that three plans have been decided upon to get more business. Two of these plans have not been made public, probably for very good reasons, but the other one, which is said to have found more favor in the eyes of the Bell people than the others, is this:

In every residence and place of business where an Independent telephone is in use, and many places where there is at present no Independent telephone, the Bell company will install a telephone absolutely free of cost and give the telephone user an opportunity to "test the efficiency of the rival services and compare them."

This plan and these tactics are not altogether new to the Bell Telephone Company where it has had to meet Independent competition, but if history counts for anything and repeats itself, the Independent company in Columbus need not fear the outcome of the fight.

COMPETITION IN RUSSIA

FROM Stockholm comes a note saying that the Swedish company which obtained the telephone concessions for the principal Russian cities when the franchise of the Bell Telephone Company expired a few years ago is doing a very successful business in Russia. The Bell Company charged very high rates and had only small and antiquated systems in St. Petersburg and Moscow. The Swedish company, under the same management that has made such a success of the Stockholm telephone system, built entirely new systems and put very much lower rates in force. This policy is proving very successful, subscribers are coming on readily and a profitable business is being done. In Warsaw the results of the first few months' working show profits equivalent to dividends at the rate of 8 per cent. per annum on the capital invested. Stockholm, by the way, has developed the use of the telephone so broadly that it now has 980 telephones to every 10,000 inhabitants, almost one telephone to every ten people. London has 47 telephones to 10,000 inhabitants, about one telephone to 200 people, so that on this showing the telephone is twenty times better developed in Stockholm than in London.

IN THE OPERATING FIELD

IMPROVED SERVICE FOR JOPLIN, MO.

THE Mineral Belt Telephone Company, of Joplin, Mo., which was recently bought by a syndicate of which Theodore Gary, of Macon, Mo., is the head, will now be put on a sound financial and operating basis. The Mineral Belt Telephone Company has in many respects been most unsatisfactory in the past owing to the lack of needed improvements, which were occasioned by a lack of adequate capital. Mr. Gary and the company behind him have vastly increased the capital of the company and it is now in shape to equip the entire line with the very best and most modern material and to extend it to any extent deemed best. New lines will be put up connecting the towns and cities of the mineral district so that immediate connection will be given and a perfectly satisfactory service rendered to Carthage, Webb City, Galena or any other city in the district. The improvements ordered will be put in as rapidly as the material can be secured and the work of putting it in place be done.

The new company is capitalized for \$200,000. Of this \$75,000 is preferred stock and the balance common stock. John W. Layne and George W. Layne, the principal owners and managers of the old company, have a large block of the new stock, which, under the adopted plans will be a guaranteed 6 per cent. stock. Local investors will hold most of the stock. One hundred and fifty thousand dollars, 5.5 per cent., ten-year bonds will be issued by the new company. The entire issue has been underwritten by a syndicate and many of the bonds sold to Joplin people.

The Laynes of the old company had under contract a new multiple switchboard for Joplin, with an ultimate capacity of 4,000 telephones. This is being built and will be installed early in the fall. Aside from this, other large contracts for telephones are being energetically pushed. All the Layne contracts for improvements now under way will be completed and others added. Seventy-five thousand dollars is the fund set aside for extension, improvements and general development.

The exchange at Joplin will receive first attention. In the meantime arrangements have been perfected to construct a number of copper metallic circuits between the exchanges, so that this class of service may be improved and facilitated.

FINANCIAL SIDE OF INDEPENDENT TELEPHONY.

PEOPLE who have studied the financial side of the telephone industry are united in the opinion that nowhere in the range of new business ventures is the possibility of quick and large money returns greater than in the Independent telephone field. During the few years in which telephone corporations other than the Bell have established lines, exchanges and the other visible properties necessary to telephone systems, it has been so manifest as to preclude contradiction that in all cases where the business has been properly managed, the dividends paid have been eminently satisfactory. To illustrate, in the small town of Carey, Ohio, two bankers, thorough-going men of business, own and operate an Independent telephone company. This company has only about six hundred subscribers, yet the enterprise to-day is paying the owners a dividend of 12 per cent annually. Again, a number of years ago, a boy, some fourteen years old, applied for and got the work of carting into the cellar of a certain bank building, in a small Ohio town, a load of coal. This was the boy's first connection with the bank. To-day he owns the bank building and is the chief official of the bank. Three or four years ago this capable young business man invested \$125 in an Independent telephone company. Since then he has invested enough more to make the total about \$7,000. For his interest in this telephone enterprise he was recently offered \$50,000. Illustrations such as these might be multiplied many times.

In Ohio about 80 per cent of the aggregate investments in telephone enterprises are in the Independent companies, and in Michigan the Independent companies and the Bell company divide the field about evenly. In Indiana the Independent telephone interests are daily becoming stronger, and in many parts of the State the Independent companies are stronger than the Bell. The bankers of Indiana are greatly interested in Independent telephone propositions and are invested in them largely.

The Bell company regards the city of Pittsburg and its environs as second only to New York City as a profitable field. It

is interesting to note, therefore, the practical proof of this belief afforded by the Pittsburg rival of the Bell company. The Pittsburg and Allegheny Telephone Company has proved itself strong and aggressive, and has already, though only in operation a little over a year, more than 10,000 subscribers connected with its system, with many more applicants on the waiting list.

The advantages of competition in the telephone business are apparent at a glance. One of the most important is, of course, reasonable rates. For the seven years preceding 1899 the rates of the Bell Telephone Company were gradually increased, until, in that year, they were almost double what they were in 1892. The coming of the Pittsburg and Allegheny company brought about a different state of affairs, and to-day the rates of the Bell company are much lower than they were, and the indication is for a still further reduction.

Another point of advantage is the payment of better wages and the employment of more skilled workmen; the construction of new buildings and exchanges and the installation of more modern equipments. Without competition in the telephone field the business men of Pittsburg would to-day be paying from \$175 to \$200 a year for the use of their telephones, and would have absolutely no redress if the service, for which they were paying several prices, was not satisfactory.

The competition created by the Pittsburg and Allegheny Company is by no means confined to local service. The Independent Telephone Company is giving excellent telephone service to substantially all points in Ohio and northwestern Pennsylvania, and even into the southwestern part of New York. Lines are being added to Wheeling, where they will connect with the National Telephone Company, of that city; to Johnstown, Pa., where there is a modern and thriving plant; to Butler and Kittanning, and thence to Buffalo, where an unusually fine plant is under construction. From Buffalo an extension will be made to Rochester, where a prosperous company of about three years' standing is in operation. The Pittsburg and Allegheny Company asserts that in all the places named it outnumbers the Bell company in subscribers nearly two to one. The Independent Company reports earnings on its present long-distance system as increasing at the rate of nearly 30 per cent a month. It will be exceedingly interesting to note the still further growth and perfection of this meritorious enterprise.—*Money*, Pittsburg.

COMPETING SYSTEMS IN RED OAK.

RED OAK, IA., now has competing telephone systems. The Montgomery County Telephone Company has opened its exchange there, and already has more subscribers than the Iowa Telephone Company, which hitherto has had a monopoly of the telephone business in Red Oak.

The Montgomery County Company has a modern and up-to-date plant, equipped with central energy and all metallic circuits. When it commenced business it had 300 subscribers, about the same number as the Iowa Company. But in addition to this, there are thirteen rural lines connected to the exchange, with about 250 subscribers, which brings the total much above the number of Iowa subscribers.

At the present time, the new Independent company is slightly handicapped by the fact that it has no toll connections. But this is being remedied, and in a short time, connection can be had with nearly every town in the State, and many nearby States. A line is now being constructed to Shenandoah which will connect with lines as far south as St. Joe. The company will also connect with the Musson Brothers system at Atlantic, which opens a connection to Des Moines and the north. Then there will be connections at once with the east through the Corning system, and as rapidly as possible other connections will be made.

TELEPHONE FOR BLOCK SIGNAL SYSTEM.

GEORGE W. COHEN, of Allegheny, Pa., according to the Pittsburg *Leader* is the inventor of a block signal system that may revolutionize those systems in use on railroads all over the country. One of the most striking features of the new system is the use of a telephone in connection with it. A telephone station is located at the entrance to every block so that in case of emergency the chief train dispatcher may be communicated with quickly.



New Companies

POMONA, CAL.—The Pomona Valley Telephone and Telegraph Union has been incorporated with a capital stock of \$50,000, divided into 10,000 shares, of which amount \$1,750 has been subscribed. The directors are: John Law, C. B. Sumner, D. S. Parker, I. F. Daniels, G. W. Ogle, A. J. Cook and Vincent W. Baker. The principal place of business will be at Pomona.

WILMINGTON, DEL.—The International Telephone Company has filed here a deed of trust for \$100,000,000. The deed covers patents, plants and other property, and its alleged object is to secure an issue of bonds for one hundred million. This company was chartered several months ago with a capital stock of \$100,000,000, but in a few days an amended certificate will be filed here increasing the capital stock to \$200,000,000. A great deal has been heard of this company in the past, but nothing tangible has been effected so far as can be learned.

DES MOINES, IA.—The O'Brien County Telephone Company, of Morietta, has been incorporated with \$10,000 capital, W. A. Burlet president and L. F. Wilson secretary.

PRAIRIE CITY, IA.—The Farmers' and Merchants' Telephone Company, of Prairie City, has been incorporated with a capital stock of \$10,000; B. J. Carney, president; John Ryan, vice president; C. C. Keister, secretary and treasurer.

OSWEGO, KAN.—The Farmers' Co-operative Telephone Company has recently been organized for the purpose of establishing a rural telephone system in the country tributary to Oswego. The chief promoters are Dave Romine and John Helwig. A franchise has been granted to this company to operate in Oswego.

ALMA, MICH.—The Michigan Telephone and Construction Company, with \$75,000 capital, has been organized at Alma. It will make a business of constructing telephone lines and has a contract for building a line at Springfield, Mo., with 800 telephones.

JACKSON, MINN.—The Jackson Telephone Company has been incorporated and expects to start construction work in a few days. About one-half of the capital stock, which is \$20,000, has been subscribed.

COLUMBUS, NEB.—The headquarters of the Platte County Independent Telephone Company, recently incorporated, will be here. The company is capitalized at \$40,000, and the incorporators are: G. L. Everett, T. J. Cuttingham, C. J. Garlow, J. G. Reeder, A. Anderson and Homer A. Hansen.

SOUTH OMAHA, NEB.—The effort is to be revived to secure a franchise for an independent telephone company to operate in South Omaha in opposition to the Bell Company. Articles have been filed with the Secretary of State incorporating the Interstate Independent Telephone Company, which has for its object the construction and operation of a telephone system in the Magic City. Its incorporators are: A. A. Wright, Thomas Healy, L. C. Gibson, Frank Crawford, W. C. Lambert, Thorwald Jorgensen, Roscoe Rowley, Daniel Hannon, L. J. Carpenter, John Flynn and James Koutsky. The capital stock is fixed at \$100,000.

FREWSBURG, N. Y.—The Home Telephone Company has been incorporated with a capital stock of \$5,000, divided into 500 shares. The main office will be in Frewsburg, and will connect with Ivory, Dodge, Fentonville, Clark's Corners and intermediate points in adjoining towns. The company is incorporated for the term of twenty years. The directors for the first year are Edward H. Scowden, George Raynor, Thomas J. Whitney, Benjamin F. Lockwood, Jackson B. Putnam, Charles Kyle, Frank A. Stanley, Charles Dodge, and Dana J. Hunt.

LANCASTER, N. Y.—The Lancaster Telephone Company, of Lancaster, Erie County, has been incorporated with a capital stock of \$10,000. Directors: W. I. Sockett, of Buffalo, and G. P. Zurbrick and W. DeC. Moore, of Lancaster.

STURGEON FALLS, ONT.—The Nipissing Telephone Company, of Sturgeon Falls, has been incorporated with a capital stock of \$5,000; provisional directors, C. W. Rantaul, Jr., A. J. Young, George Gordon, O. Aubin, H. E. McKee, L. E. Bolster, T. E. McKee.

FORT WORTH, TEX.—Pennsylvania capitalists are seeking telephone

franchises in Dallas, Fort Worth and other Texas cities. The Fort Worth Telephone Company has been organized with these officers and directors: H. A. Fuller, president; Joseph D. Lloyd, secretary and treasurer; directors, J. L. Dunn, H. A. Fuller, F. M. Kirby, J. Frank Nuss, William Drury, John B. Yeager and F. C. Johnson, all of Luzerne County, Pa., and S. L. Samuels, Martin Casey and F. B. McElroy, of Fort Worth. The capital stock of the company is \$304,000, all paid in. The same Pennsylvanians are preparing to organize a company in Dallas and then extend to other large cities of the State, in competition with the Southwestern Telephone Company.

RICHFIELD, WIS.—The Richfield, Menominee Falls and Holy Hill Telephone Company, with the principal office in Richfield, Washington County, has been incorporated to build a telephone line from the village of Richfield by way of Goldenthal to Menominee Falls, and from Richfield to Holy Hill by way of St. Hubertus, with a branch line to Meyer's Mill in the town of Richfield; capital stock, \$1,000; incorporators, Henry H. Zaun, Hulda Zaun and Bertha M. Zaun.

Financial

FOREST CITY, ILL.—The Forest City Telephone Company, of Forest City, has increased its capital stock from \$2,500 to \$5,000.

INDIANAPOLIS, IND.—The directors of the New Long Distance Telephone Company, at the regular monthly meeting declared a 3 per cent. dividend, payable October 1, to stockholders of record September 25. Hereafter, dividends will be paid in quarterly installments. Mr. Sheerin, president of the company, said that a 1 per cent. dividend will be paid the 15th of January, 1903, and at least a like dividend quarterly thereafter.

BOSTON, MASS.—The Philadelphia Bell Telephone Company has declared a dividend of 2 per cent., payable October 25 to stock of record October 18.

BOSTON, MASS.—The attempt of Noble, Moss & Co. to locate the holders of Michigan Telephone bonds with a view of acting in concert with a Boston house in adopting some concerted plan for the defense of the holders in the reorganization plan which will probably be decided upon, develops the fact that not more than one-sixth of the amount issued are held in Detroit and Michigan. These holders have, it is said, signified their intention of acting in concert with the eastern holders in any course of action that may be decided upon.

GRAND RAPIDS, MICH.—The Citizens' Telephone Company held a meeting recently and declared the regular quarterly dividend of $\frac{1}{2}$ per cent. The company decided to build another toll line from Portland to Lansing, via Grand Ledge, the demand for service being so general that more than 120 telephones have already been ordered. An additional toll line will also be constructed from Grand Rapids to Moline. Work will be commenced on the new lines at once and pushed rapidly forward in order that service may be given at the earliest possible moment. The new directory, which is the fourteenth edition, contains the names of 4,768 subscribers.

NORTHVILLE, MICH.—The Northville Telephone Company at its annual meeting declared a dividend of 15 per cent. The construction of a new line to connect with Plymouth was ordered, also one to run east to Livonia.

LYONS, N. Y.—The improvements now being made by the Wayne County Telephone Company will be paid for by a new issue of bonds, amounting to \$50,000.

NEW YORK, N. Y.—The directors of the New York and New Jersey Telephone Company have authorized an issue to stockholders at par of \$3,125,000 in proportion to their present holdings. The company's present stock amounts to \$9,375,000. Payment will be required, 40 per cent. November 1, 1902, 30 per cent. May 1, 1903, and 30 per cent. August 1, 1903. Stockholders, if they prefer, may pay in full November 1 at 101.50 per share.

CLEVELAND, O.—A call has been issued for the annual meeting of the stockholders of the Federal Telephone Company. The place of meeting will be in East Orange, N. J. Action looking toward the final liquidation of the company will be taken.

HONEYBROOK, PA.—The Borough Council has passed an ordinance

THE WEEK'S MESSAGES *Continued*

providing for the imposing of a tax of \$2.50 per year on every telephone wire passing through the town.

PHILADELPHIA, PA.—President Mitchell, of the Bell Telephone Company, has issued a circular to stockholders announcing that the Board of Directors have determined to issue 40,000 shares of new stock, to cost \$50 a share.

Legal

CAPE MAY C. H., N. J.—In the Cape May courthouse recently the jury in the \$5,000 damage suit of the estate of Alfred H. Hackney versus the Delaware & Atlantic Telephone Company, returned a verdict of \$2,000 for plaintiff. The action grew out of the death of Hackney from the result of injuries received in an accident, caused by his horse becoming frightened at the reel wagon of the telephone company in June last.

HALLETTVILLE, TEX.—In the suit of the Southwestern Telegraph and Telephone Company, the San Antonio & Arkansas Pass Railway Company in county court, for condemnation of right of way of the railroad company from this place to Eagle Lake, damages were allowed the railway company in the sum of \$195, this being at the rate of \$5 per mile.

Rates

KANSAS CITY, MO.—The ordinance providing for the city counselor to enforce the telephone rate ordinance against the Missouri and Kansas Telephone Company has been adopted by the lower house on the recommendation of the finance committee. City Counselor Ingraham is preparing a petition against the telephone company which will shortly be submitted to the circuit court.

Franchises

REDLANDS, CAL.—Application has been made by Attorney Campbell for a new telephone franchise here. A like petition before the Santa Anna council was voted upon favorably, and the franchise has been offered for sale. The Sunset fought the Santa Anna proposition bitterly and made a fifty per cent. reduction in former prices charged.

MANITOU, COLO.—The El Paso Telephone Company has asked the town council for a franchise to operate telephone lines in Manitou.

ORLANDO, FLA.—The Orlando City Council has granted to the Sanford Telephone Company a twenty-year charter to erect poles and wires and operate a telephone line in this place. The line will connect Sanford, Longwood, Altamonte Springs, Maitland, Winter Park and Orlando and will probably connect with the local exchanges in the different places.

WAYCROSS, GA.—The Southern Bell Telephone and Telegraph Company has been granted a twenty-year franchise here. The franchise is granted with few restrictions for the period mentioned above, and is given with the understanding that a complete new telephone system be constructed here at once.

AURORA, ILL.—The Interstate Telephone and Telegraph Company, of this place, has been granted a twenty-year franchise by the West Dundee Village Board. The ordinance provides that the company pay the corporation a revenue of \$1 a telephone during the last five years of the life of the franchise. Five free telephones will be installed for the city. All wires in the fire limits will be laid underground. Residence telephones must rent for \$1.50 a month and business telephones \$2. All instruments must have a copper metallic circuit one-party line. The company agrees to have the new system in working order within eighteen months. The East Dundee Corporation has been awaiting the action of West Dundee and may follow suit.

CARLINVILLE, ILL.—The National News Telephone Company has been given the right to erect a line through the county.

MACOMB, ILL.—The petition of the Western Illinois Telephone Company, for permission to erect lines and poles in the highways outside the cities and villages, has been granted.

MARSHALL, ILL.—P. F. Dodd has been given permission to erect a telephone line along the public highways, commencing at the village of Melrose, running southeast to the county line between Clark and Crawford counties, and a spur to extend to the county line between Clark and Crawford counties; also south to the county line under the laws and restrictions governing telephone lines of the State of Illinois.

ROCK ISLAND, ILL.—The Union Electric Telephone and Telegraph Company has been given permission to set poles along the highways in South Rock Island to connect this city and Milan with its lines.

BUNKER HILL, IND.—John H. Wiles and E. F. Wiles have been granted a franchise to construct and operate a telephone system here.

LOUISVILLE, KY.—The Home Telephone Company will ask for a franchise at the next meeting of the City Council.

SHELBYVILLE, KY.—Pursuant to an ordinance enacted by the City Council, Mayor L. C. Willis has sold at public outcry a franchise to construct, operate and maintain a telephone exchange in Shelbyville for the

period of twenty years. Under the ordinance the upset price was fixed at \$500. When the Mayor called for bids, C. G. Harrison, acting for the Home Telephone Company, of Louisville, bid the upset price of \$500. The only other bid was that of James C. Bright, a capitalist of this place, who bid \$501, and the franchise was knocked down to him. The Cumberland people, who have been operating an exchange here for years under a permit of the City Council, had a representative present, but made no bid. Mr. Bright, who bought the franchise, is said to be neither connected with the Home Company, of Louisville, nor the Cumberland Company. He intimated that a company of Shelbyville capitalists would organize a telephone company, and that they would operate under the franchise he purchased.

LE MARS, LA.—The Sioux Valley Telephone Company is desirous of putting in a system in Le Mars, and its representative, W. H. Harter, was here recently and presented a petition to the City Council asking for a franchise to operate in this city. The Sioux Valley Company has its headquarters at Cherokee and has lines branching to Correctionville and other points and is desirous of coming west from Cherokee.

DETROIT, MICH.—A new ordinance for a franchise for the proposed Independent telephone company here has been introduced into the city council.

YPSILANTI, MICH.—A telephone franchise has been granted to Shelly B. Hutchinson to construct a system here. It is said the Mayor will veto the franchise.

INDEPENDENCE, MO.—An ordinance has been introduced granting to Samuel F. Wilsoa the right to erect and maintain a telephone system in Independence.

DAVID CITY, NEB.—The city council has granted a franchise to the Benedict Telephone Company, of Benedict, Neb. This is an independent company and will connect with all other independent lines in this and adjoining counties. The new company has quite a large list of subscribers, and it reports the outlook decidedly encouraging. This will give David City a competing line, and the new company also promises quite a reduction in rates.

MANALAPAN, N. J.—The Monmouth Telephone Company has been granted the right to erect poles and string wires along the county road between Manalapan and Milhurst.

MERCHANTVILLE, N. J.—The Eastern Telephone and Telegraph Company has been notified that it has forfeited its franchise, as the ordinance under which it was granted provided that the company should have its exchange in operation within six months from the date thereof or forfeit all rights granted thereby.

AURORA, O.—The Mutual Telephone Company, which operates between here and Moore's Hill, has asked the city council for franchise to put up its poles and line through certain streets and alleys of the city, as it intends to open an exchange here.

MARION, S. DAK.—J. A. Steninger will petition the town council for a franchise to construct a telephone system here, and as soon as it is granted work on the system will begin.

OSHKOSH, WIS.—The application of the Winnebago Telephone Company for a permit to enter Oshkosh has been delayed through a written opinion of City Attorney J. F. Kluwin, in which the attorney claimed that the proper procedure had not been followed.

Elections

OTTAWA, ILL.—A meeting of the commissioners named by the Secretary of State in the charter issued to the "Home Telephone Company, of Ottawa, Illinois," resulted in the election of the following board of directors: Lorenzo Leland, Al. F. Schoch, V. J. Duncan, A. C. Godfrey, R. C. Packard. The Home Telephone Company expects to have its exchange in operation by February next. Its wires will be underground in the business district, and in cables throughout many other portions of the city.

LA FAYETTE, IND.—The People's Co-operative Telephone Company has elected the following directors to serve for one year: Morton C. Cann, William O. Laid, John S. Storms, John W. Skinner, Edgar N. Stout. The following officers were elected: M. C. Cann, president; J. S. Storms, vice president; M. R. Johnson, secretary; W. O. Laird, treasurer.

WARREN, O.—The Madison Telephone Company at its annual meeting in Warren elected the following officers: President, C. W. DeVoe, Orwell; vice president, Dr. H. M. Fenton, Cleveland; secretary, N. R. Williams; Orangeville; treasurer, E. U. Hyde, Orangeville; general manager, E. E. Howes, Mesopotamia. The other director is Dr. C. S. Fenton, of Orangeville.

Underground

GREENFIELD, MASS.—The New England Telephone Company is extending its underground conduits in this town.

LOWELL, MASS.—In accordance with the permission recently granted it, the Bell Telephone Company will soon commence putting many wires underground.

THE WEEK'S MESSAGES *Continued*

MINNEAPOLIS, MINN.—The Twin City Telephone Company has been given permission to lay additional underground conduits.

RED BANK, N. J.—The town council of Red Bank has granted a franchise to the New York and New Jersey Telephone Company to put all its wires within the town limits in underground conduits.

ROCHESTER, N. Y.—A general conduit ordinance has been drawn by City Engineer Fisher governing the laying of conduits for wires. This ordinance is supplemented by special ordinances whenever conduits are to be laid providing that the conduits shall be under the same restrictions as govern those laid under the franchise of the Rochester Gas and Electric Company. The object of this method of procedure is so that the company will not get the right to use the streets outside of its franchise. Under the ordinances now being followed the city can take over all new conduits, the same as it can those laid under the franchise of the gas company.

CLEARFIELD, PA.—The Clearfield and Huntingdon Telephone Company is laying its wires underground through the city.

Competition

ATHENS, GA.—A telephone war is on at Athens between the Bell and the Danielsville and Comer companies.

SCOTTSVILLE, N. Y.—A new telephone line is soon to be put through on the road south of this village and will compete with the Bell Company. Prospects for a new local exchange are also good, and better service at much lower rates will be guaranteed. The long-distance service will also be an important feature.

DYERSBURG, TENN.—Parties are here endeavoring to put in a new telephone system in competition with the Cumberland Telephone and Telegraph Company. They have received about 100 subscriptions, and it now seems assured that the new system will be installed. The demand for the competitive system is brought about by the fact that the Cumberland people have curtailed the service by refusing connections with the county, to those other than holders of straight line telephones, and the new company also proposes to put in its telephones at a cheaper rate per month.

Combinations

PADUCAH, KY.—The new telephone company now preparing to begin business in Paducah has secured an option on the Alexander telephone line.

FULTON, MO.—Frank W. Buffum has purchased the Fulton Telephone Exchange and all connecting lines owned by the Fulton Telephone Company for about \$21,000. T. W. Rosser is local manager and promises some improvements for the exchange. The Fulton Telephone Exchange was formerly the property of T. P. Harrison, J. W. Jacks and J. V. Kemper. There are now about 310 local telephones. The following toll lines also run into the central office. Columbia Short Line, 20 stations; Tebbetts and Mokane, 15 stations; Mexico and Fulton, 3 stations; Farmers & Traders, 65 stations; McCredie Eastern, 9 stations; People's Line, 20 stations; Montgomery City Line, 8 stations; Columbia Toll Line, 4 stations; Bourbon Line, 20 stations; Hatton & Fulton Line, 20 stations; Boydsville Line, 17 stations; Bachelor Line, 4 stations; Auxvasse Toll Line, 8 stations; Jefferson City & Fulton, 14 stations; Concord, Hatton and Hereford.

BINGHAMTON, N. Y.—A meeting of stockholders of the Binghamton Telephone Company will be held here for the purpose of having the stockholders vote upon the proposition to sell their stock, property and franchises to the New York State Telephone Company, and for the transaction of such other business as may properly come before the meeting.

TOLEDO, O.—The Toledo Home Telephone Company officials say that there is absolutely no foundation in fact to the rumor that a consolidation of the Home and Bell company plants is or has been contemplated.

Construction

JACKSONVILLE, FLA.—The Southern States Telephone and Telegraph Company will construct a long-distance telephone line from Jacksonville to Starke, in Bradford County, and Ocala in the southern part of the State; and to the following points west of Jacksonville: Lake City, Live Oak, Madison, Monticello, Tallahassee and Quincy.

MASCOUTAH, ILL.—The Kinloch Telephone Company, which is building a line to this city, has reached Rentchler, about five miles west of here, and will shortly have the line finished. A local system will be put in operation here.

PEORIA, ILL.—Work on the conduit system of the new telephone plant is being pushed. The system being constructed in Springfield is at a standstill on account of non-delivery of necessary supplies.

SAN JOSE, ILL.—The Forest City Telephone Company is setting poles in this town for a new line.

TAYLORSVILLE, ILL.—Dr. A. T. Bridges, of Stonington, and Dr. R. E. Henshie, of Taylorville, who were recently granted a franchise, will construct a telephone system here. The new exchange will be a continuation of the O'Dell system. The line as proposed will enter Taylorville from the northeast, being projected from the Stonington system, which is owned by Dr. A. T. Bridges.

TERRE HAUTE, IND.—The Citizens' Telephone Company is making preparation to build two new toll lines, one to Coal Bluff and one to St. Marys this winter, and have them connected by next spring.

EDDYVILLE, IA.—The Eddyville Telephone Company will extend its line from Dudley to Chillicothe as soon as possible.

EXIRA, IA.—The Audubon County Telephone Company is building a telephone line from the central office here over to North Branch, in the edge of Guthrie county. A second line will be constructed, running out southeast of town and perhaps one or two more lines will be built this fall running out from our town.

MINBURN, IA.—A new telephone line will be built to connect Minburn and Perry.

PARIS, KY.—Workmen are excavating for the underground wires of the new Home Telephone Company.

AUGUSTA, ME.—The Augusta, Winthrop & Gardiner Railway Company will install a complete telephone system, independent of any other system, and it is expected that it will be in running order by the first of next month. Telephones will be placed in the waiting rooms at the various turnouts along the whole system.

JACKSON, MICH.—While the People's Telephone Company is rushing its city works, Superintendent Hirsch is not neglecting his toll system, and is repairing the lines from this city to Concord. Lines will be run to Clark's, Ackerson's and Vandercook's lakes and Addison in the near future. An Indiana line will also be constructed.

MILFORD, MICH.—A telephone exchange here is now assured, and the work of constructing the lines and central office will begin immediately. Fifty subscribers have been secured, and the promoters are confident of doubling the list in a short time.

FARMINGTON, MO.—At a meeting of the Board of Directors of the Farmington Telephone Company it was decided to improve the Farmington part of the system in keeping with the recent improvements on the line between here and Flat River. Four cables will be erected, extending a distance of 6,000 feet and costing \$4,000. Nearly all of the present poles and wires will be taken down and used in extending the system in the lead belt and in the country. New cedar poles have been ordered, and the system will be strictly up to date. All circuits will be made full metallic.

MEMPHIS, MO.—The negotiations between J. C. Hubinger and the Clark County Telephone Company, in which Mr. Hubinger sought to buy the lines there have fallen through. J. C. Hubinger will now build his own line through Clark County, putting in good material and perfect construction.

PIERRE CITY, MO.—Colonel Peel, of the Home Telephone Company, of Springfield, stated that 600 subscribers had been secured and work on the line would begin at once. When completed local subscribers will have connection with Springfield, Joplin, and all the surrounding towns.

PLATTSBURG, MO.—The People's Telephone Company will soon commence work, greatly improving its system and service here.

ALBANY, N. Y.—Lines of the Independent Telephone Company are to be extended to Cornell and Leonore. The Grand Ridge exchange, recently established, is meeting encouragement, new instruments being subscribed for nearly every day.

CALEDONIA, N. Y.—The Interocan Telephone and Telegraph Company is constructing a line between this point and Avon. It has a representative in town who has secured thirty subscribers to a local exchange, many among the farmers.

CORTLAND, N. Y.—The Cortland Home Telephone Company has made extensive arrangements for increasing its facilities during the coming winter. One hundred miles of wire for use on the toll lines was received, and before next spring it is expected that at least 250 more miles of wire will be strung. Two circuits will be added to the line connecting this city with Syracuse.

HIGH HOUSE, PA.—There is talk of extending the telephone line from Woodside to this place, and also connecting it with farm houses along the line.

JOHNSTOWN, PA.—The farmers of Indiana County have started a movement, the ultimate aim of which is to build a telephone line to Johnstown. The plan of the company is to connect Indiana with towns and farm properties in the northern part of the county. In time, it is the purpose to extend the line to Blairsville, Ebensburg and Johnstown.

WARREN, PA.—John H. Wright, manager of the Warren Telephone Company, has closed a contract with the Home Telephone Company, of Jamestown, N. Y., for the construction of a telephone line from Jamestown to Warren. It is to be completed within sixty days.

WAVERLY, TENN.—C. M. Cooley, R. M. Horner, G. B. McKeel and several other prominent business men and farmers are making arrangements with Manager Wells, of the telephone company, to put in a telephone line from here to Danville. There will be about twenty subscrib-

THE WEEK'S MESSAGES *Continued.*

ers along the route. This line will connect with the Houston County system.

UNION, S. C.—Work of construction on the new Union telephone system, which has been delayed for some time on account of extensive improvements, which the proprietor, L. W. Floyd, at first did not contemplate making, will be resumed at a very early date. It was first intended to put in a common-return system, but he has decided instead to make all circuits full metallic. The work of constructing out-of-town lines, which will connect with points all over the State, will also be pushed, and heavy copper wire will be used. R. G. Spearman, who has been in charge of the constructing force here for some months, has been made permanent manager of this exchange.

WEBSTER, S. D.—The farmers living in the vicinity of Webster have taken so kindly to the rural telephone system running from that place that the company has found it necessary to run a third wire on its north branch as far as Greenville. Extensions are also being made to two localities south of Webster.

WALLISVILLE, TEX.—The Old River Rice Irrigating Company is working at both ends of the line, planting poles, etc., for a telephone line from Wallisville to the rice plant, thence to Mount Belvieu. This will connect the western part of the county with the county seat. The line crosses Mayes island.

HUGHESVILLE, VA.—The telephone line which has been building for a long time, is now being rapidly completed by N. B. Warner, of Hamilton, Va., superintendent of the Snickersville Telephone Company. The poles have all been put in place, and are now ready for the wire.

PARKERSBURG, W. VA.—The directors of the West Virginia Western Telephone Company held their meeting in pursuance to the call issued, the main purpose of which was to discuss the proposed bond issue. A resolution was discussed to appoint a committee with power to issue \$75,000 in bonds, and if necessary to increase the issue to \$150,000. About \$40,000 of the bonds have been subscribed by the citizens of Parkersburg, and a syndicate will take the balance of the \$75,000 issue. The directors also contemplate improvements in Clarksburg and Sistersville, and discussed the plan of putting in an exchange at Sistersville, where they have considerable money invested, which brings no income.

Miscellaneous

TAMPA, FLA.—The Peninsula Telephone Company has been awarded the contract to install its instruments in the city hall and emergency hospital, as well as all other municipal departments. The city obtained these telephones at a reduced rate. The Peninsular Company has now 750 telephones in operation, and expects to reach the 1,000 mark in a very short time.

ALTON, ILL.—Grafton and Calhoun counties are about to be connected by telephone again, as they were a few years ago, by a cable under the Illinois River at Wheeler's Landing.

CHICAGO, ILL.—The Union Electric Telephone and Telegraph Company has certified to a change of location from Chicago to Rock Island.

FAIRMOUNT, IND.—The new Co-operative Telephone Company for Fairmount is booming, and shares are being subscribed for by prominent and influential business men at a rapid rate. The matter will have been placed on a firm foundation by the opening of spring and the construction work commenced in earnest then.

GOSHEN, IND.—The farmers supporting the Davenport telephone exchange in Clinton Township have been unable to make toll agreements with the big companies, and will build a line of their own to Goshen.

NEW CASTLE, IND.—The new Independent telephone company now has 170 telephones in working order, and is rapidly completing the plant. All the cables have been connected, and 500 feet additional put up. The company hopes to have the plant entirely completed in thirty days.

DES MOINES, IA.—The Mutual Telephone Company is figuring on the purchase of a new switchboard with a capacity of 5,000 lines, and if it is decided to purchase it, it will be equipped at once for 3,000 installations. It is intended to devote a portion of it to the accommodation of party lines the company is planning to build into the country to provide rural service.

ELDORA, IA.—The Eldora Mutual telephone system is now practically installed. The company will start with about 125 subscribers, and it is believed the number will be swelled to 200 in a few months. The central office will do the switching for the 14 farmers' lines entering the city, and the exchange will cover both city and country.

SHELBYVILLE, KY.—James C. Bright, who bought the telephone franchise offered for auction here recently, was acting as the representative of the Cumberland Telephone and Telegraph Company.

BALTIMORE, MD.—The Baltimore and Reisterstown Turnpike Company has conveyed to the Maryland Telephone Company, in consideration of

\$2,000 the right to plant poles and string wires on the Reisterstown road to Reisterstown, on the Hanover turnpike from Reisterstown to the Pennsylvania State line, and on the Westminster turnpike from Reisterstown to the Pennsylvania State line. Pay stations may be established at toll-gates, and the officers, directors and gatekeepers of the Turnpike Company are to have the free use of the instruments.

OAKLAND, MICH.—The State line service of the Oakland Telephone Company is now in operation. The Oakland company is connected with the Owosso Telephone Company at Holly and through that company gets connection with practically all the western and central portion of the State. A reduction of the present rates of the Michigan company is announced. Connection with Detroit is now the greatest need to the Independent system of Oakland County.

PONTIAC, MICH.—Connections have been made between the Alma Telephone Company and the local Independent exchange, and local subscribers may now communicate with all points in central and western Michigan without resorting to the Bell telephones.

CARROLLTON, MO.—The Missouri Valley Telephone Company now has connection with Standish, Wakenda, Bosworth, Hale and Bogard. In a short time the service will be extended to every town in the county.

BEATRICE, NEB.—The Beatrice Home Telephone Company, which was recently granted a franchise to operate its lines in this city, has established an office here, and is getting ready to go after business in earnest.

GENEVA, NEB.—E. E. Placek, of Wahoo, was here recently, looking up the prospects for organizing an Independent telephone company. He came here in the interest of Fort Dodge, Ia., capitalists, who are closely connected with the owners of the Wahoo Independent company, and want to work along the same lines. They claim to have plenty of money to back the company here capitalized for \$50,000, but would prefer to get local capital to take a half interest. Mr. Placek says the Wahoo company has a system of 300 capacity, with nearly 400 farmer telephones, and connection with all towns in the county, giving free toll service to all but two. The Independent company charges \$1.50 for office telephones, \$1.00 for residences and \$1.00 for farms. Mr. Placek says the Bell Company had about 75 telephones in Wahoo at \$3.00 and \$1.50 per month when the home company organized, and that they now have only about 50, although they offer to put them in for almost nothing. He says that they made three-year contracts for farm lines last spring, and that there is no indication that they ever intend to build them. In fact, it is the general belief there that the Nebraska people never expect to give farm service, and that their only object in making contracts is to kill the Independent movement.

CORTLAND, N. Y.—The villages of Dryden and McLean have been connected with the Home Telephone office in this city. The line is owned by the Tioughnioga Telephone Company, which will soon have a line in operation to Ithaca.

GORHAM, N. Y.—An effort is being made to run a telephone line from Gorham to Geneva, for the convenience of shippers at that point.

EGAN, S. D.—It is expected the local telephone exchange will be completed in about two weeks.

WEST CHENANGO, N. Y.—The directors of the Mt. Ettrick Telephone Company met here recently, and decided that if enough stock could be secured along the route, they would extend the line from Glen Aubrey to Whitney's Point.

Personal

STERLING, ILL.—Fred Woods, for four and a half years manager of the Whiteside-Harrison Telephone Company and latterly of the Interstate Independent Company, which absorbed the former about one year ago, has tendered his resignation, to take effect October 15.

HENDERSON, KY.—The Board of Directors of the Henderson Telephone and Telegraph Company have elected as local manager G. W. Turpin, who for some time has had charge of the Independent exchange at Seebree. Mr. Turpin takes the place of J. W. Walker, who has been compelled to resign as local manager on account of his health. Mr. Walker will continue to be general manager, however, as the duties of that office are not so arduous.

ST. PAUL, MINN.—Francis M. Buck, second vice-president of the Twin City Telephone Company, will sever his connection with that concern October 1. Mr. Buck has been with the Twin City since last September, and has made an enviable record for himself.

BUFFALO, N. Y.—William E. Harkness, for the last ten years connected with the Bell Telephone Company of Missouri, has resigned his position as traffic manager. He has accepted the office of general superintendent of construction, operating and maintenance of the Consolidated Telephone Company of Buffalo, N. Y.

THE WEEKS MESSAGES *Concluded*

PROVIDENCE, R. I.—At the meeting of the directors of the Providence Telephone Company, Joseph F. Beck was elected general manager of the entire system controlled by the company. Mr. Beck was formerly the assistant general manager, and because of his ability and thorough knowledge of the duties of the office, upon the death of General Manager Albert C. White, he was considered the logical candidate for the position.

TRADE NOTES

THE ACME ELECTRIC COMPANY, Chicago, has recently sent out a very attractive little catalogue which shows much painstaking effort, both in compilation and also printing. The catalogue describes some of the leading types of the company's telephone sets and switchboards. Interspersed with the descriptions of the products of the Acme plant, Mr. E. J. Walsh, treasurer of the company, has some catchy, to-the-point sayings and proverbs which are strictly original. A few of them are quoted here:

The man who waits for something to turn up is apt to discover that it is his toes.

All things come to those who do their waiting after they get rich.

Take things as they come—but remember there are lots of things that it will pay you to go after.

We go after business and manage to get our share because our goods and prices are right. It will pay you to get acquainted with us.

Opportunities are very sensitive. Slight them once and they seldom call again.

Only a fool would trust a man who says the world owes him a living.

Some men manage to keep from being imposed upon by being disagreeable.

Man wants little here below—and he usually gets about half that much.

The average man is always anxious to know the worst of his neighbor—probably because of the fact that misery loves company.

A wise man knows only his own ignorance; a fool thinks he knows everything.

Success never roosts on the banner of the man who neglects his business.

Always do the best you can and let others think as they will.

Some men are born poor, some achieve poverty and some marry extravagant wives.

Some men pay cash for everything they buy because they want to and others because they have to.

It is said that a man can truly love but once, but the average man does a lot of experimenting.

The average man fails to learn a lot of things that experience should teach him.

Human nature always crops out every time a collection is taken up in church.

The prompt payment of debts is the one virtue lacking in many a man's make-up.

Many a man's success is due to the fact that he never attempts to do anything beyond his ability.

Never enter into a partnership with a man who is smarter than yourself.

There is always a chance for a man to go higher if he has the ability to climb.

If a man has plenty of push he is bound to get there—but sometimes a pull helps along wonderfully.

"Never give up" is a good motto for the people who don't pay their debts.

The river flows quietly along towards the sea, yet it always gets there. It might be well to remember this when you are trying to rush things.

Faith in your own ability is two-thirds of the battle.

When a fool hen takes a notion to set she doesn't care whether there are any eggs in the nest or not, and some men are built on the same plan.

Good sense is heaven's choicest gift—and in order to obtain it most men have to make the trip to headquarters.

It's often better to be the sole owner of a small dog than a stockholder in a large one.

These catalogues will be sent to any address free by addressing the company.

THE STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY has recently declared a dividend of 2 per cent on the common stock and 1¾ per cent on the preferred stock of the company.

THE EUREKA ELECTRIC COMPANY, Chicago, has just put out a very handsome colored folder, illustrating some of the Eureka Company's latest apparatus, shown in their natural colors. This is a particularly clever piece of work, original and new in the telephone field. The Eureka Company will cheerfully mail this handsome folder to those interested.

THE DEVEAU TELEPHONE MANUFACTURING COMPANY, New York, is distributing the tenth edition of its handsome catalogue, describing the DeVeau Telephones and Telephone Apparatus.

This book consists of 128 pages, profusely illustrated with half-tone cuts of the apparatus manufactured by the DeVeau Company, and is handsomely bound in green. It shows nearly every piece of apparatus used in modern telephone construction, including telephones, intercommunicating telephones, magneto generators, power generators, construction material, etc. The DeVeau Telephone Manufacturing Company, 27 Rose street, will send copies of the catalogue to those interested.

OBITUARY

WILLIAM FRESHOUR, superintendent of construction of the Home Telephone Company, at Greenville, Ohio, died recently in that city.

PLANTS FOR SALE

FOR SALE—One of best equipped telephone exchanges in Kansas; price, \$22,000; upon which amount plant now NETS 23 per cent. If you mean business, address X for particulars, care of AMERICAN TELEPHONE JOURNAL, New York.

TELEPHONE PLANT FOR SALE—160 telephones, 100 miles of toll lines; excellent opportunity for extending business; will sell for \$12,000; pays 15 per cent. net on this amount. Address TELEPHONE CO., care of AMERICAN TELEPHONE JOURNAL.

WANTED

A HOME IN SOUTHERN CALIFORNIA—I desire to communicate with a man capable of taking charge of a factory for insulating rubber-covered National Code wires. This is a splendid opportunity for the right man. References given and required. No money necessary. Address P. O. BOX 1116, Los Angeles, Cal.

POSITIONS as linemen by two experienced workmen. Would prefer construction work in Michigan or nearby State. Address R. M. M., care AMERICAN TELEPHONE JOURNAL, New York.

POSITION as foreman or superintendent with telephone or construction company. Twelve years' experience in telephone construction work; best references furnished. Address J. W. S., care AMERICAN TELEPHONE JOURNAL, N. Y.

POSITION in an exchange of 100 to 500 subscribers, as manager or assistant manager. Experienced in construction and switchboard work; references furnished. Address EVAN PAUL JONES, North Vernon, Ind.

EXCLUSIVE handling of an account, for Chicago trade, beginning January 1st. Manufacturers Agency basis. Address SALESMAN, care AMERICAN TELEPHONE JOURNAL, Monadnock Building, Chicago.

STEADY position as troubleman. Thoroughly understand switchboard, line and instrument work; five years' experience. Address C. R. SAVAGE, Lebanon, O.

EXPERIENCED telephone traveling salesman; acquaintance with Northwest trade preferred, but not essential. Address THE VOUGHT-BERGER COMPANY, makers of telephones and switchboards, La Crosse, Wisconsin.

POSITION by a competent and experienced salesman of electric light, telephone and street railway material, by a young man with 14 years' experience in this business; best of references. Address L. C., care AMERICAN TELEPHONE JOURNAL.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISSELL CO., Toledo, Ohio.

POSITION as manager or superintendent of small exchange; at present in charge of small exchange; 31 years old; married; strictly temperate; references furnished. Address A. B. C., care AMERICAN TELEPHONE JOURNAL.

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THE TELEPHONE IN STREET RAILWAY OPERATION

ONE of the most important adjuncts to a large urban street railway system these days, is the telephone. Where tried in the operation of street cars, the telephone system has been found indispensable, as it has also in the great railway systems of the country. The telephone, however, has not as yet come into general use for train dispatching, although several great railroad systems are now using it for this purpose. So up to the present time, its chief field of operation in street car and railroad systems has been incidental to that of dispatching cars. And here it has given universal satisfaction, and not in a single instance has it been abandoned.

For the best practical study of the telephone in connection with a street railway system, Philadelphia is by far odds the best place. Here the Rapid Transit Company controls and operates all the cars that run over the enormous area of the old city of Brotherly Love, and also in most of the suburbs for miles around. For the perfect operation of this enormously large system of transit, the telephone has been found absolutely necessary. It has been subjected to the severest trials, and never found wanting.

Within the past six weeks, an entirely new system has been installed here. And naturally, when the directors of the railway company decided to reconstruct their telephone service, they wanted the very latest, quickest and best system possible. After due deliberation, the new contract was given to the Keystone Telephone Company, which has met with such remarkable success since its advent in Philadelphia.

The system as it now stands is as nearly perfect as it is possible to make it. The Rapid Transit Company already had a system of conduits and cables which practically paralleled its entire trackage. At convenient places, it also had the pole boxes shown in the accompanying illustration. But these were equipped with antiquated instruments and primary batteries. The Keystone

Company took these boxes and entirely remodeled them, putting in Kellogg transmitters and receivers. These are now all the apparatus in the pole boxes, for they are equipped with common battery and are used only for calling, therefore needing no bell. The Keystone Company also built a new switchboard for the private exchange. It represents the very latest and best switch-

board construction, being of the common battery type. Kellogg jacks, cords and plugs were used and drops made by the Lambert-Schmidt Company. A new supervisory signal constructed by a New York firm were first installed, but were found very unsatisfactory and did not work properly. They are now being replaced by lamp signal supervisory furnished by the Kellogg Company. The switchboard has an ultimate capacity of 220 lines, of which 151 or more are now in operation. The Transit Company operates the system itself, paying a rental to the Keystone Company for the apparatus.

Of the 151 or more lines now in operation, there are 90 of the pole box stations, which are used in the actual operation of the railway system. These pole box stations are placed nine or ten on a line, so that the actual number of lines used for them is not more than twelve out of the total number in operation. The rest of the lines are taken up with a service which connects every department and power house, etc., of the company. It is possible for the manager to sit in his private office, and keep in

perfect touch with every detail of the railway system. He can call up anyone from the chief engineer of one of the power houses to the train dispatcher, situated at a far off terminus of the road.

This, of course, is a great help. But the pole boxes have been found to be invaluable. A young man sitting at a desk in the main offices of the company, is kept busy all the time by reports, etc., from these stations. For instance, a car may break down in such a way as to delay traffic. The conductor of the car,



SWITCHBOARD IN THE RAPID TRANSIT COMPANY'S PRIVATE BRANCH EXCHANGE.

goes to the nearest box, calls up and reports the trouble. The operator also has control of all the "hurry-up" wagons. He immediately dispatches a wagon to the scene of the accident, and the trouble is repaired in short order. The company also has a corps of street inspectors—one or two for each line. It is the business of these inspectors, to ride to and fro over the line, report the condition of the cars and tracks, etc.

The operating room formerly occupied was situated on the third floor of the offices of the company. This building is not fire proof, and there was always the danger of a fire paralyzing



STREET CAR POLE BOX.

the system, and besides the room was entirely too small. The difficulty has been overcome by the construction of a new room. This room embodies many novel features. It is set on steel stilts to the height of the third floor of the old building, and is adjoining this building, so that it seems part of it. But it is entirely fire proof and heavy iron doors completely cut it off from the main building. Now even were the old building to burn down, this exchange room would still be left standing, and the telephone service would not suffer. No better illustration of the importance of the telephone system in the eyes of the Rapid Transit officials can be shown than this very fact.

TIME LIMIT OF TOLL MESSAGES

By A. L. HUTCHINSON

THE paper read by Mr. W. W. Dilworth at the Kansas City Convention and published in the AMERICAN TELEPHONE JOURNAL September 27th, deserves more than passing attention.

There is no reason under the sun why a telephone company should not receive pay for the use of its lines in proportion to the time its lines are in use. People will take every advantage

to get free service, or a great deal at a little cost and the only way a company can protect itself is by enforcing the time limit. Otherwise, suppose A calls for B. A tells B what he wants and uses the line five minutes in doing so. After an hour B calls back for A, says it is an answer and holds the line five minutes in giving the answer. B is justified in saying that it is but one message and that his call is the answer, but unless the time limit is enforced the company is virtually giving two messages for one fee. By fixing a time limit and charging for the excess, no matter if the line is used for an hour on a single message, the company is getting full pay for value received.

It is not necessary as intimated by Mr. Dilworth to charge five cents per company for each company whose lines are in use for a certain excess time. The only practical way of settling joint toll business is through a central office or clearing office for all companies, and in such a case, the splitting of a nickel is necessary in every instance.

The rates adopted by the Wisconsin State Association at its June meeting is a step in the direction of perfecting a system of joint toll charges which are just and equitable, though at present are not perfect.

The rates adopted are as follows: Air line distance between conversing stations to be taken in all cases for fixing rate, no matter how many different companies intervene; seven miles, 10 cents; fifteen miles, 15 cents; fifteen to twenty-four miles, 20 cents, and 5 cents for each additional eight miles. Time limit five minutes. For excess time, where rate is 25 cents or less, charge 5 cents for each two minutes or fraction. Where rate is over 25 cents and under 50 cents, charge 5 cents for each extra minute and where 50 cents or over, charge 10 cents for each extra minute. The fault with these rates is that on long distance they figure out as high as or even higher than the Bell rates, though for short distances the rates are less and are satisfactory. At the next meeting of the Association there will have to be a revision, that as zones increase in number they also increase in width with the same additional charge per zone.

In dividing the fees of joint messages, each company is allowed the air line distance of its own lines, plus five miles for each exchange or switching station; if the originating station is a toll station, 15 per cent is deducted, and if an exchange station 25 per cent is deducted, and the balance divided among all the companies, in proportion to the mileage which each company has, bears to the whole mileage. By this scheme every company gets every cent it is entitled to. The time has come when it is impracticable for individual companies to check and audit their joint business with other companies. The only practicable and feasible way is through the clearing company which is entirely distinct from and has nothing to do with the operation of any company, or fixing rates. Its duties simply are checking messages, carrying the proper accounts, and striking a balance at the end of the month between the various companies. I believe that the State Telephone Clearing Company, of Wisconsin, is the only incorporated company for that purpose in existence and its system is so simple and flexible as to be applicable to all conditions and terms of connecting companies.

Other States have systems of checking and settling between various connecting companies, but none have the simple and yet comprehensive system of the State of Wisconsin.

ANOTHER SWEARING DECISION

A FEW weeks ago a St. Louis Justice ruled that swearing through a telephone was aggressive profanity. Justice Doolley, of Chicago, now holds that swearing into a transmitter is disorderly conduct. The swearer thus rebuked pleaded in vain that he was hungry, wanted to telephone for his dinner and had found the ear of "Central" deaf. The man who consults the telephone must be urbane and long-suffering. Does he pray to no purpose at the shrine of that powerful divinity "Central"? Is he cut off imperiously in the middle of his talk? Never mind. Let us be patient and not wear out our tissues with impotent anger. Count from 1 to 500 or say the multiplication table. Be greater than he that taketh a city. There is no joy but calm. And when you sprinkle magical numbers upon the heat of your temper, don't be rash and sudden like that hot spirit who, when angered, would count 100 thus: "One, two, ninety-nine, hundred, damn!" —The Sun.

THE TELEPHONE SERVICE IN CONNECTION WITH FIRE AND POLICE SIGNAL SYSTEMS*

By JERRY MURPHY, Superintendent Police Patrol Service, Cleveland, O.

IN PRESENTING this paper, I do not aim to revolutionize police and fire alarm signaling apparatus, nor do I wish to convey the idea that my suggestions are entirely new. On the other hand, I submit the paper for the purpose of learning, through discussion among the more able members of our association, the many ways in which the telephone can be operated successfully in connection with police and fire alarm systems.

The telephone is taking a more active part in our police and fire alarm systems year by year, so that we do not question the advisability of having telephonic connection direct from the exchange at headquarters to the different fire station houses, police precinct station, as well as to the officers' residences. Sometimes, however, they may not seem so desirable to many of us; for instance, when one is aroused at 2 a. m. to remove some "trouble" that has occurred from the effects of a wind or sleet storm. When responding to a call of that character we sometimes wish that Professor Bell had not been so successful in the experiments which enabled him to place his apparatus, that has been so wonderfully successful, on the market. However, be that as it may, we all admit that the telephone affords instantaneous means of concentrating and facilitates the successful operation of our departments, especially our police departments.

Comparing the signal boxes in the market to-day with those of fifteen or twenty years ago, we all recognize and appreciate the many improvements in design and workmanship. Yet, in my opinion, no police box is complete without telephonic connection.

We have in our city of Cleveland 150 patrol boxes, the product of several different manufacturers, there being three police precincts covered by the old style, plain signal boxes. The service rendered by those boxes is merely to call the wagon when the signaling patrolman has a prisoner he wishes to convey to the station. They are the "make and break" signal box, and have no telephonic connection, so are better adapted to fire alarm than to police signaling. We also have four precincts covered by the improved boxes, which have telephonic connection.

The records in our department show that there are more depredations committed in the precincts covered with boxes of the old style than in the precincts protected by the improved style. Although the former precincts are populated by a much less troublesome class of persons than the other precincts, the number of crimes and depredations committed there are 20 per cent. greater than in the latter precincts, and the arrests are 20 per cent. less.

Within the last year we supplemented the old style boxes, in one of those precincts, by improved boxes having telephonic connections and found at the expiration of one year that the percentage of crimes and depredations committed became so small that it attracted the attention of our officials. They became convinced and satisfied that the change made in the style of the boxes, resulted in the decrease of crime in those precincts. No question or doubt was left in their minds as to the advisability of installing the most modern and improved signal boxes that could be obtained, throughout the entire city.

For police telegraph departments, I am a firm advocate of having everything connected with one central office, in preference to a district system. I am aware that this statement will meet with the disapproval of some of our members, but as I stated before, the purpose of this paper is to give members a chance to exchange their ideas and opinions along this line, as well as on other subjects. The reason that I approve of a central office is (notwithstanding that the cost of outside construction is probably 20 per cent. greater, with a slight increase in costs of maintenance, the office equipment being about the same in both cases) that, in my opinion, more discipline can be exercised in the department, and favoritism prevented between officers and patrolmen, when all records of calls and reports are kept by a corps of operators who are especially employed for that purpose.

Where the combination signal box is in operation, and patrolmen are required to use only the mechanical signaling apparatus for reporting what is termed their "duty call," it is a well known

fact that often patrolmen have neglected to "pull" the box when expected to do so, through carelessness or negligence, and no report of their lack of attention to duty was received by their superiors owing to the friendship which existed between them and the officer in charge at the station where the signal should have been received. It has, also, been shown where patrolmen are required to report "duty calls" by the manipulation of the mechanical apparatus of a police box, that one man will oftentimes report for several others, allowing the other patrolmen to remain in their "coop" all night, or part of it, leaving the territory assigned to them, and the citizens whom they are supposed to protect, to the mercy of thieves and thugs.

Those conditions can be avoided, I am satisfied, in a system which is operated on the central office plan. When an officer becomes suspicious of a patrolman who has neglected to send in his "duty call" at the time required, and no report is received of the same, the officer can rest assured that his troubles will become multiplied if the inattention to duty is not checked. If the suspicion rests upon an operator and he be in the habit of overlooking such "minor offences" as he probably calls them, a trap may be set for him by making a confidant of one or two patrolmen. Let them neglect pulling a box at intervals for several nights, then if it is not reported, the conclusion can be reached that the office force is weak and negligent, and that a change should be made. Again, if an officer or an operator is of the opinion that some one man is reporting for other patrolmen, I would suggest that the officer or other person should signal him to talk over the telephone in the box, engage him in conversation until they are satisfied that he is the proper man. If they are still in doubt they can send the patrol wagon with its crew to the box and ascertain definitely the identity of the signaler. It is only in extreme cases that the latter suggestion would have to be acted upon, however, as I hold that an operator who is employed in any exchange for a sufficient length of time, will become so familiar with the different voices of the men that he will be able to recognize and distinguish the person he is talking with, without any difficulty.

Where this practice of requiring operators to communicate with the patrolman on the outside, and where it is understood by those men that this is the practice of your department, it will have the tendency to discourage any attempts on the part of the patrolmen to shirk, or neglect, their duty.

The object our officials have in view in installing a police telegraph and telephone signal system, is that of improving, in a material way, the efficiency of their department. If that object is not accomplished, it is not the fault of the chief or commissioners. But it is the fault of the superintendent in charge of the police telegraph and telephone system, whether, or not, his electrical appliances are in perfect condition, if patrolmen on the outside are "beating" his boxes. It is his duty to see that the system is used correctly and intelligently, for the purpose it was installed.

Combination police signal boxes should be so distributed that the best results can be obtained. Where men are reporting "duty calls" every half hour, there should not be more than eight boxes on each circuit in order to prevent any interruption when two boxes are "pulled" simultaneously. The telephones, in my opinion, should be connected in multiple on two parallel wires reaching over the territory covered by four metallic box circuits. The central energy system, or as it is commonly termed, "common battery," should be employed, so that by removing the receiver from the hook, the signal to the operator will be given, and at the same time cut in the transmitter. This method of connecting telephones in our police boxes, I consider, is the most rapid, and requires less manual labor than with local battery. Telephone wires to the operating board should be so arranged that officers at any of the street boxes can communicate with any station house, or officer in the department, and vice versa. I am also of the opinion that the patrolmen should be able, through the medium of the box telephone, to connect with any subscriber connected with the public exchanges. This would prevent the necessity of the patrolmen

*Paper read before National Association Municipal Electricians, Richmond, Va., October 7, 8 and 9.

leaving their beats, in case they should discover something which would require the attention of some citizen.

Furthermore, I consider it necessary in order to make the police telegraph and telephone signal department an indispensable adjunct to the regular force that the signal boxes with telephone equipment be placed in such localities that they will, as much as possible, close all avenues of escape—such as depots, boat landings and streets in close proximity to suburban car lines—to suspected criminals. In my department during the last few years the detectives have made several good catches through the services rendered by these telephones.

Only recently, while one of our detectives was strolling along one of the principal streets, he, by chance, met a fellow, whom, as he thought, but was not positive, tallied with the description of a fugitive who was reported to have escaped from the Columbus Penitentiary. Rather than take any chances of making a mistake by trusting to the meager description he carried in his mind, he immediately went to a patrol box in that vicinity, and called up his headquarters by telephone. He got a more accurate description of his man and upon returning to the street discovered that the suspect was the much wanted man and arrested him. The detective thereby earned the reward which hung over the criminal's head, and returned to prison an enemy to society.

In order to facilitate service, we should not neglect to distribute keys to the boxes liberally, in their neighborhood. It may be true that on account of the distribution of the keys among citizens, that a large number of false runs will be entered upon the record book of the department. Notwithstanding that the wagon men often find no prisoner at the end of a call, that should not discourage the superintendent of the system. In many cases where the wagon is called, by a citizen having access to a key, and no prisoner is found, the mere fact that he sent for the police, was sufficient to stop the trouble at hand. Oftimes affairs of a more serious character have been brought to a sudden finish in this manner, and the patrol wagon made only a "water haul" having gotten no prisoner.

Quoting the words of our Director of Police, although I have no authority for so doing "A citizen with a patrol box key, swings as much authority as a uniformed policeman. That we cannot dispute."

The next question before us is, to what extent does the telephone help to improve the efficiency of our fire alarm telegraph department. Many cities and towns throughout the United States are dependent entirely upon the telephone for the purpose of sending fire alarms to headquarters. This method has proven very unsatisfactory, owing largely to the fact that the ordinary person, when he discovers a fire, becomes excited. His first impulse is to notify the fire department. This often necessitates a run sometimes a quarter of a mile or more before a telephone station can be reached. Allowing that the telephone is in perfect order the operator is signaled by an excited individual, and may be busy answering other calls, so that the user, not receiving any answer to his signals, becomes impatient. He generally repeats his signals in such rapid succession that the operator becomes aggravated and concludes that a "crank" is on the other end. Consequently the operator does not answer the signal until he or she finds it quite convenient to do so. During this unnecessary wait of a minute or two, which, to the user, has been magnified into hours of waiting, the fire gains rapidly. The wait and his anxiety to make known his find, causes the user to become wrathful, and when the operator finally condescends to answer the signal, he talks with such rapidity and incoherence that he cannot be understood, resulting in more delay. When the connection with fire headquarters is finally made, the user's mind has reached such a stage of excitement that it is with considerable difficulty that the location of the fire is learned, and oftimes the wrong address is given and received at headquarters. I have been informed by Mr. Joseph Rothgary, the superintendent of our fire alarm telegraph department, that about 5 per cent. of the alarms received in his office by telephone are wrongly sent. He also admits that when an alarm is properly sent by telephone, there is a loss of time owing to the numerous connections that are necessarily made before the companies in the district in which the fire is located receive the notification. This loss of time, however trivial it may seem, often endangers life and property.

In my opinion it is to the advantage of every superintendent of a fire alarm telegraph system to discourage as much as possible the use of the telephone for the purpose of sending fire alarms to headquarters. It is true that some municipalities

are not liberal enough in the distribution of their signal boxes and especially so in the residence districts, and that the telephone is frequently more accessible than the signal box, yet, I hold that the time gained through the convenience of the telephone is lost through the delay in the transmission of the message, and that the signal box is quicker and less liable to error. Where such conditions exist, it appears to me that an understanding should be had with the telephone companies that an emergency line be held in reserve at all times, to be used for no other purpose than to transmit fire alarm notifications. That line number should be placed in conspicuous places so that citizens would become familiar with it, and no time would be lost in hunting for the number in the telephone directory. I would also advise that when that line is called into service the exchange operator should be instructed to remain in the line when the connection is made with the fire headquarters, so as to render any assistance he or she can in case difficulty is experienced in obtaining the location of the fire.

There are various other reasons why the telephone should be discouraged as means of fire notification. I am just reminded of an incident which occurred recently. A patrolman, while walking his beat, found a telephone wire lying on the street. Having read of the danger attached to fallen wires, he decided not to disturb it. He reported the matter to his lieutenant at the station house. It happened that the officer in question did not have an extensive knowledge of the English language. On receiving the report, the lieutenant immediately called up the police exchange. "Say, der is a wire down on Sawyer Street, between Cambridge and Inman," said the lieutenant in an excitable manner, using some of the broken English for which he is noted.

The exchange operator, not wishing to lose any time, immediately notified the fire headquarters of the location of the supposed "fire" as given him by the lieutenant. The operator at fire headquarters with as much rapidity as possible, sent four companies to the location of the reported fire. On reaching the location given, it was found that there was a wire down on Sawyer street, instead of a fire. It is unnecessary for me to say that hereafter when the lieutenant reports any fires or other mishaps, he is requested to spell his words before taking any chances.

About two years ago our city council passed an ordinance compelling all persons moving houses across, or along streets to notify the fire department when they leave a house on the street over night. This was done so as to avoid any collisions with the fire apparatus should a fire occur in that neighborhood.

Recently a foreigner who was engaged in moving a house was compelled to leave the structure stand on a street over night. Complying with the ordinance he went to a telephone and called up the fire headquarters.

"Who was dis?" queried the foreigner, when the operator at the fire exchange answered his call.

"This is the fire exchange," said the operator.

"Say, vire on house by Broadway and Gallup street; Look him oud," said the house-mover, and then he hung up the receiver, not thinking that a reply was necessary, and wondering of what use the whole formality of reporting a house on a street.

Now, what other conclusion could a fire exchange operator arrive at when he receives such a message? He decided there was a fire somewhere in the district mentioned and immediately dispatched sufficient apparatus to the scene. It was only through a miracle that some of the apparatus failed to collide with the house that the foreigner thought he was warning them to look out for.

Notwithstanding all that has been said, the telephone can be made a very useful instrument in connection with the fire alarm telegraph department.

I desire to call your attention to the telephone as a means of locating line troubles in our fire alarm telegraph and police patrol systems, and the benefits that we can derive from judicious use of it. We all know the sensitiveness of the ordinary receiver diaphragm and how it responds to small variations in the amount of current passing through the receiver magnet coils. We do not have to look far back to the time when it was customary for our linemen and trouble chasers to taste for battery on the line, since it was not practical to carry an office outfit with them. Now, tasting is all right, when you have the right kind of stuff, but crosses with telephone lines, to-day, almost always means 10 to 26 volts, since the adoption of the central energy system has

become general. Not to mention the possibility of crosses with lighting or power wires, the higher voltage maintained by telephone companies using the central energy system on their lines, makes it essential, for safety and accuracy, that we provide some better means for our trouble men to know the conditions under which they are working. A portable telephone set in the hands of a lineman will enable him to determine the conditions of the line with an accuracy that otherwise could not be obtained without the use of expensive instruments that would scarcely be at his disposal, and with which he probably would not be conversant.

Now, on occasions of this kind, I believe that the telephone can be made very serviceable, if an ordinary closed circuit jack is cut in series with the line at each signal box, and the linemen be compelled to carry a portable telephone set connected with a plug, he can obtain the same results obtained by the old method, without running any of the risks incidental to that method.

These jacks can be used for other purposes, if the box circuits are connected with the telephone switchboard at headquarters. Each company in the city should be equipped with a portable telephone set, and when communication with headquarters is desired by a chief or his subordinates, while at work

at a fire, the circuits can be used as telephone wires. By this method, instructions can be transmitted with more rapidity than by using the old method of telegraphic code. There are numerous other ways in which the telephone can be made a useful adjunct to the fire alarm system, we shall learn from members present who have had occasion to know its strong points as well as its weak ones.

In conclusion. It is a well known fact that the police and fire department throughout the United States are dependent entirely upon their electrical departments for success, therefore, it devolves upon every member of this association, who has under his charge either a police or fire alarm telegraph signal system, to keep the system of which he is at the head, in perfect order. The system should be kept up to such a point of efficiency that the department which it is in, either police or fire, will not be hampered in the least by it.

The telephone should be used whenever it is to advantage and it is not good policy to curtail in a stingy manner the maintenance account, as this generally results in weakening the efficiency of the system. By the heads of the systems and their subordinates giving to their departments constant attention, success is sure to follow.

IN THE OPERATING FIELD

COMBINATION TELEPHONE SYSTEM AND NEWSPAPER.

THE Churubusco (Ind.) *Truth* is an excellent example of the success that may be attained in publishing a paper in a comparatively small town. Churubusco, according to the last census, has less than one thousand population. Although a good live town, it is not a county seat, nor is there any special reason why a newspaper should attain a large circulation there. Yet Virgil A. Geiger, who purchased the paper thirteen years ago, when it had no circulation or influence worth speaking of has worked the business up until it has become a valuable and a fine paying property, and the success of the paper can be ascribed, more than anything else, to the telephone system which is run in connection with it.

When Mr. Geiger took hold of *The Truth*, the plant consisted of a lever job press and less than one hundred dollars worth of equipment. To-day it owns three modern presses run by steam power, with folders, job presses and an up-to-date establishment in every particular. *The Truth* is housed in its own two-story building, is free from all debts and mortgages, and is earning for its proprietor a nice income every year.

Two years ago Mr. Geiger conceived the idea that a telephone exchange in connection with his newspaper would be of great value to him in the collection of local news and he at once proceeded to Chicago and before returning contracted for the necessary equipment of the Stromberg-Carlson Telephone Manufacturing Company, they sending a man to install the system. In less than two years over 250 telephones have been installed, of which 150 are farmers, there being in the neighborhood of two hundred miles of country lines. He also owns toll lines to Ege, Ari, Hellers Corners, Blue Lake, Noblesville, Green Centre and Wesley Chapel, with long distance connections with over 700 towns and cities in Ohio, Illinois and Michigan. All of his lines are metallic and with the very best of material it is needless to say that his patrons are more than pleased with the excellent service furnished them. In return for the local news furnished him by his farmer patrons the operators at central give them each morning all important news of the previous day, including market and weather reports. He finds that the telephone service is very valuable to him and each week carries a column of "Telephone Notes," which are gladly furnished by his patrons. That the farmers are satisfied with the treatment and service given them, no better evidence could be had than the demand for country telephones and while a force of men is kept busy stringing wires there will be at least one hundred contracts that will go over until spring, when arrangements will be made to completely cover the remaining territory in Whitley, Noble and Allen counties tributary to Churubusco. Mr. Geiger ascribes his success to the fact that he watches all details and keeps both his paper and telephone exchange up to the standard.

WANTED: AN INDEPENDENT SERVICE

WHITE PLAINS, N. Y., is up in arms against the poor service of the New York Telephone Company, which at present, has a complete monopoly there. The complaints which are voiced through the medium of the *Journal*, an enterprising publication of White Plains, are directed more against the operators than the equipment. Here is a sample of the *Journal's* arraignment:

"It seems impossible to get good service except by giving substantial gifts to the operators or by filing repeated complaints with the New York office. A subscriber calls up the central office, and after waiting for five to fifteen minutes, gets it, requests a certain number, and, after again waiting from five to fifteen minutes, is impertinently told that the line is 'busy,' or the number 'doesn't answer.' To prove that the central office is deliberately lying, two subscribers agree to meet at their respective offices at a certain hour and one calling the other receives responses as above. A resident of Broadway, at about eight o'clock in the evening, attempted to talk with a business friend at Ossining. After ringing central for a few minutes, the aristocratic individual in charge answers and says he will notify the subscriber of the connection when made. Waiting a half hour the subscriber again calls the central office. Receiving no response after fifteen minutes' continuous ringing, the subscriber, now thoroughly incensed, grabs his hat and starts for a personal interview with the despot at the central office. After lighting the gas in the office stairway and hammering the door for awhile, he is received by a young lad yawning and stretching, who blandly informs the infuriated customer that he forgot the call and that he mislaid the slip. The forceful language used by the subscriber at the time had a perceptible good effect for twenty-four hours only. The office here is poorly managed, customers insulted and the rights of the public wholly ignored. Generous Christmas gifts is the the only sure way of getting decent treatment."

NEW INDEPENDENT SYSTEM

The plant of the People's Telephone Company, of Jackson, Mich., has been put into operation with over 1,000 city subscribers, and connecting with 2,000 telephone subscribers in the county. The People's Company is amalgamated with the Citizen's Telephone Company, Grand Rapids, Mich., and has a number of toll lines radiating from its exchange and penetrating surrounding rural districts, giving connection with about 2,000 farmers. Besides this, it has connection with all points in Michigan with the exception of Detroit, Ypsilanti and Ann Arbor. Connection with these cities will be made in the very near future. The People's Telephone Company also has connection with nearly every city, town and village in Ohio, and in other surrounding states.

Opinion and Comment

THE NATIONAL ASSOCIATION.

THE announcement of the Inter-State Independent Telephone Association, calling the regular annual convention at Chicago for December 9, 10 and 11, brings forward, once more, the question of the consolidation or absorption of the National Association by the Inter-State. The sentiment on this proposition seems to be not wholly one-sided, as nearly as the AMERICAN TELEPHONE JOURNAL can determine from its correspondents. There are some telephone men who seem to feel that it would be an excellent thing if the Inter-State could be induced to take over the National, bag and baggage. There is quite an active majority, however, who seem to feel that such a step would not be wholly advantageous.

In reaching this conclusion the men who make up this majority are influenced by diverging views. One of the most important operators in the field in combating the proposition writes us as follows:

"What would the Inter-State gain by such a consolidation? To-day it is a strong, healthy, vigorous organization, greater in every sense than the National. Consolidation between the two would only bring into the Inter-State an element that has shown its manifest incompetence by the gross mismanagement of the affairs of the National."

Another man looks at the question from an entirely different standpoint. He says:

"There is a distinct necessity for the existence of a National association, an association that shall represent the entire country, and not merely a section of it. To wipe out the National Association would be a distinct calamity at this stage. The thing to do is not to wipe out the National Association, but to reorganize it, to put at its head men who will give this organization the same energetic, progressive management that has made the success of the Inter-State."

On one point all hands seem to be agreed. This is that the affairs of the National Association have been grossly mismanaged and that the combination controlling its affairs are responsible for this condition.

Commenting upon the editorial published by the AMERICAN TELEPHONE JOURNAL, last July, after the National Convention at Philadelphia, a prominent operator has this to say:

"Having been a member of the so-called executive committee of the National Association, I have seen some of the weaknesses of the association, and I am heartily in favor of the changes you suggest. This association can be of untold benefit to the Independent telephone interests if the right men can be induced to give it time and attention."

In the editorial spoken of, the AMERICAN TELEPHONE JOURNAL strongly urged the necessity of reorganization and suggested that it might not be a bad idea if the National should be absorbed by the Inter-State. This editorial called out a great many letters, the tone of which was invariably favorable to the general ideas expressed. It would be manifestly improper to give, at this time, the names of the writers of these letters, but, as the originals are all on file in this office some extracts may properly be published without the taint of anonymity which ordinarily weakens communications where the name of the author is not given.

Another influential man had this to say:

"Referring to the editorial in THE AMERICAN TELEPHONE JOURNAL, July 5, it meets in every way our hearty approval, except, we think, the association would be no better off with Mr. Dougherty as president. We think there should be an entire change of officers; get the control of the association entirely out of the clique which it has been run by ever since it was founded. We congratulate you in having nerve enough to print the editorial and come out flat-footed on the subject."

The head of one of the largest companies operating in the East went into the question even more thoroughly. He wrote:

"In commenting on this article as a whole, we beg to say that a great number of the largest operators of Independent telephone companies in the United States are not in any way affiliated with this association, which is wrong. The association should be organized on a basis and officered by such men as to attract both the large and small operators in this line of business to join it and give it their moral and financial support. While we have no reason to criticize the officers of the National Association, we do feel that it could never be rejuvenated by merely a change of officers. We think reorganization or a new plan outlined is the only safe future for this association. In the five years it has been organized it would appear to the writer that very little progress has been made in any direction, unless it be in the direction of the defense of patent suits, of which, of course, we are in no particular position to judge, as we know nothing of their methods of handling these suits. But we do think that a proper association should be organized as follows: First, organize State associations. Second, the State associations should send a certain number of delegates to the National Association, and the whole matter should be a business transaction instead of a jollification, as it has always appeared to the writer to be."

From Chicago came this letter:

"In our opinion the National Association has done very little to materially advance the interests of Independent telephony. The idea of a National association we consider highly important to the movement, but in order to procure the best results from such an association, it should have a progressive management, the object of which will be the dissemination of knowledge to Independent telephone operators, financiers and the public in general, in such a way as to educate them and increase the usefulness of the movement in general. We believe in one organization of enthusiastic workers, whose sole aim shall be co-operation and the advancement of Independent telephony in the interest of the greatest number concerned."

Opinions similar to these might be reproduced almost without number, but this selection shows conclusively the general opinion regarding the management of the National Association's affairs. Since the Philadelphia convention matters have been moving along a little more briskly, but that anything practical is being accomplished along the lines generally desired by men who have the welfare of the Independent movement at heart, is not apparent.

There is none of the active business briskness that is demanded by the situation. No steps are being taken to organize, or reorganize, the association along truly representative lines, that is, by getting in touch with the State Associations and arranging with these for representation on the basis of membership.

Things seem to be drifting along in the same old way. The only thing that is heard of the National Association's officers is when they appear before the State conventions with an appeal for funds. If the association was really representative there would be no need for such an appeal. The Independent industry is very rich and prosperous and the people interested, operators as well as manufacturers, are fully prepared to supply any amount of money needed. But they hesitate, and very properly, in the absence of a specific demonstration that shall show the old slothful condition of the National Association to be at an end. This demonstration may be satisfactorily made in one way—by the resignation of Judge Thomas as President. A specific promise was made at Philadelphia that if the delegates voted for Judge Thomas' re-election that gentleman would resign in a few months. All that he asked, his friends asserted, was an opportunity to get out honorably. It is now nearly four months since the convention adjourned and there is not the slightest indication that Judge Thomas' promise of resignation is to be made good. Instead, industrious circulation is being given to statements lauding his services to the cause of Independent telephony and setting forth his disinterested work. Both at the New York and Kansas Convention addresses were made by Judge Thomas' friends, holding him up as a man who had given his time without pay to the advancement of the general good.

On the face of them, these statements are rather plausible, for it is true, that Judge Thomas has never drawn any salary as President of the National Association. But he has nevertheless, been repaid very handsomely in dollars and cents. It is generally understood that because of his position as President of the association, he was first made general manager of the United States Telephone Company, of Ohio, and afterwards President of the T., T. & C. Company, of New York. Both of these appointments came to him because the men interested in these companies sought the standing that would naturally come to their organizations if the head was the President of the representative association of Independent operators. They wanted, not Judge Thomas, but the president of the National Independent Telephone Association, and they paid handsomely.

In New York alone, for his eight months' service as President of the T., T. & C. Company, he received \$25,000.

If there was no other reason for Judge Thomas' retirement, the fact that he is no longer a telephone operator, should suffice to make him withdraw. He is at present connected with one of the Eastern indemnity companies with offices in New York. There are some men who believe that the National affairs would be no better under the domination of Mr. Dougherty. If that is the case, the sooner this is ascertained the better, in order that Mr. Dougherty in turn may be succeeded by some man who has the time and capacity to put the National Association on a progressive, permanent, successful basis.

JOINT USE OF CONDUITS*

By CHARLES F. HOPEWELL, S. B., Cambridge, Mass.

THE joint occupancy of a single conduit system by all classes of electric wires can be considered under two distinctive heads. There are the engineering and the economic side of the question, but inasmuch as the economic side of the question is dependent upon the engineering practicability of such a system, I will discuss that part of the question first.

The engineering features that I desire to consider are three. These are, respectively, the method of construction, method of operation and the determination of the requisite amount of separation necessary for perfect safety between the high and the low tension wires. As a preliminary to these considerations, I wish to consider the question of dangers that are liable to be encountered.

The dangers incident to conduit operation are two, namely: Explosions and burn-outs. While to many they appear as the same, yet nevertheless they are distinct from each other. An explosion in a manhole, where it almost invariably occurs, is due to the ignition of gas which has accumulated there, either sewer or illuminating gas. The gas can be ignited by an electrolytic spark from a cable sheath or from the wheels of a passing car or other causes. The result is generally the blowing off of the manhole cover, but it seldom results in damage to the cables. These are liable to occur in telephone conduits as readily as in electric light conduits. This might be called an exterior cause, as it results from causes exterior to the cables themselves. Burn-outs can be classed as interior causes, as they are caused by the break-down of insulation in the cables. Such break-downs result in the melting or breaking down of the cables. A distinction should here be made between electric light cables and railway feeder cables. In the former case a breakdown results in a ground and not necessarily in a short circuit, consequently it does not infer a burn-out except in the case of an Edison system with its neutral grounded mains. Of course if there is another ground on a circuit at the time the break-down occurs, you will then get a burn-out, but this should be very rare. In the railway system this is different, as one side of the circuit always remains grounded, so that a break-down almost always leads to a burn-out. The severity of this burn-out depends entirely upon the method of operation of the system. These burn-outs result in heating the air in the manholes and blowing off the cover. The results are much more serious, in many cases due to faulty method of construction and faulty operation. The Edison tube system I shall not consider, as it is already an obsolete system and is fast disappearing.

This leads me to the question of what I mean by faulty method of construction and operation. Faulty method of construction I consider to comprise all kinds of conduit built of conducting material, such as iron pipe, or ducts with an iron covering where joints every eight feet place the cable in contact with iron rings metallically connected to such iron cover. In this class of construction you will readily see that a break-down of insulation immediately charges the entire conduit from manhole to manhole. The current then flows through the break-down to conduit and from conduit to the lead sheath of the other cables, thereby destroying them. In tile conduits there is no such liability, for it cannot exist.

I desire to call your attention to this very important fact, that I have never been able to learn of a break-down in a cable in one vitrified duct passing directly to a cable in another vitrified duct, unless such passage of current took place in a manhole. There has never been a burn-out in Cambridge, although the Boston Elevated Railway Company has twenty-one miles of tile duct in this city and has had cable in it since 1897. Moreover, there has never been a burn-out in Roxbury, a part of Boston, where such a construction is used, where a defect in a cable in one duct has led to the using of a cable in another duct. There have been many instances of burn-outs in Boston where the current has passed from one cable to another, but they have always been in cement conduit having an iron shell. All the Boston Elevated Railway burn-outs have occurred in conduits of such construction.

Cables, instead of being systematically separated in manholes, have been laid up together, whereas they should all be insulated from each other, but of course bonded to a ground return wire

capable of taking the current of any one cable to such ground return rather than allowing it to pass to any other cable sheath. This bonding is necessary to prevent electrolysis.

Faulty method of operation, which has been the cause of a large number of burn-outs, consists in not properly watching the cables and forestalling a break-down in insulation in the same where the insulation shows deterioration. Another very prolific source of such trouble is the method of throwing the circuit-breakers at the central station back in again when they have once opened. I have known of an instance in Boston where a circuit-breaker was held in until it burnt out in the hand of the attendant.

In the serious burn-out in Boston on the street railroads in times past, at Summer street and Atlantic avenue, we found that both conditions were present; namely, faulty construction as well as faulty method of operation. The Boston Elevated Railway Company has since given up the attempt to burn out a cross on their feeder, and now leave their circuit-breakers out after three attempts to close it. Formerly they lined up their operators at the switchboard and threw the circuit-breakers in, and thus sent their entire central station energy through the cable break-down in order to burn it clear. I will now consider, from the standpoint of practice rather than theory, what the requisite separation should be between the high and the low-tension wires to ensure perfect safety.

In joint conduit construction there are two classes of construction, differing only as to whether all the cables enter the same manholes or whether separate manholes are used, respectively, for the high and the low-tension wires. If each corporation operating cables possess individual manholes, then such a system will fall under the latter category.

In proof of my contention of the practicability of such a system for joint occupancy by high and low-tension wires, I desire to bring forth the actual condition of construction and operation as found in practice in many of our cities. If it can be demonstrated that such joint occupancy is safe and practical in these cases it will necessarily follow that such construction will be safe and perfectly satisfactory wherever adopted.

I will cite the following cities as possessing conduits jointly occupied by both classes of cables

NEW YORK CITY.—Mr. C. I. Walker, chief engineer of the Empire Subway Company, has publicly stated in a hearing at the Massachusetts Legislature that there are over twenty miles of conduits in New York City where the high-tension ducts are directly over the low-tension ducts, with only a 6-inch concrete separation between these ducts. There was also a mile where the two classes of ducts were laid side by side, with a separation of 14 inches. These ducts were moreover of iron.

CAMBRIDGE, MASS.—The West End Street Railway Company constructed in 1897 a mile of conduit for their own wires and wherein the city was given two ducts. The city ducts enter separate manholes built by that company especially for the use of the city.

These city manholes are now connected with manholes of the telephone conduit on the same street for the purpose of carrying the city wires from one conduit system to another.

Mr. Walter R. Eaton, the chief electrical engineer of the Cambridge Electric Light Company, has publicly stated that a combined conduit system using separate manholes was practical.

PHILADELPHIA.—David R. Walker, for twenty-five years head of the Electrical Bureau of Philadelphia, has stated that the electric light and telephone wires have been in successful operation in adjacent ducts in Philadelphia for over ten years. The ducts used were of wood or tile and the cables entered the same manholes.

ROCHESTER, N. Y.—In Rochester, N. Y., the Rochester Telephone Company has had over 250,000 feet of telephone cable in electric light ducts since May, 1900, and installing 80,000 feet more. It has experienced no difficulty in operation, although its cables enter the same manholes with the electric light wires.

CHICAGO, ILL.—In Chicago over 100,000 feet of high and low-potential cables have been in successful operation for the past ten years, some of the cables carrying current at 8,000 volts. These cables occupy the same manholes with the low-tension wires, but are grouped on separate sides of the manholes. On Archer ave-

*Paper read before National Association of Municipal Electricians, Richmond, Va., October 7, 8 and 9.

nue, in Chicago, the railway company and the city have built a combined conduit system at a very large saving in cost over a separate system.

BALTIMORE, MD.—There are in use to-day over 5,000 feet of conduit used in joint operation by the high and low potential wires and occupying the same manholes. The conduit is owned by the city.

The subject of the practicability of the operation of high and low-potential wires in the same conduit has been investigated by two expert and competent commissions. One appointed by President Harrison, in 1891, for Washington, D. C., recommended a general conduit system with separate manholes for the high and low-potential wires, and the ownership to be by the city.

Another commission appointed in 1896 to consider the subject of conduits for Baltimore recommended a general municipal conduit system. Baltimore has already expended over \$600,000, out of an appropriation of \$1,000,000, for such construction. They have installed a combined conduit system with single manholes of large size.

In many other cities of this country conditions will be found where high and low-tension conduits are laid side by side or cross each other, so that to all intent and purposes they might have been installed as one conduit system as far as any question of safety was concerned. In Boston many cases of this kind occur, notwithstanding the fact that each conduit was laid separately.

It is good logic to say that if high and low-tension wires can be placed within six inches or a foot of each other without danger, then it must follow that there is no advantage in placing them any farther apart. The theoretical basis of "the further apart the safer it is," means little after a point of safety has once been found and beyond which no accident is liable to occur. This is especially true where such a limit has been found from practical operation.

In concluding my discussion of the engineering features of conduit construction, I will state what I believe to be the best practice regarding such installation.

The conduits to be installed for all classes of service as a single conduit system, with a double set of manholes. The system to have a subsidiary distributing system to contain only low-tension wires.

The conduits should be built of non-conducting and permanent material, preferably of tile. Single ducts to be used for high-tension wires, as it gives a double wall between ducts. Low-tension ducts to be of the multiple type. The low-tension ducts to be laid on top of the high-tension ducts and separated therefrom by six inches of concrete cement. (This would not be necessary if proper method of operation were insisted upon). The distributing ducts to be laid on top of the low-tension ducts. The entire duct system should be imbedded in three inches of concrete cement with a one-inch plank on top. For wide streets a double system of distributing ducts may be necessary, and these should be located one on each side of the street. The subsidiary ducts to enter handholes placed as far apart as possible, yet close enough to prevent any lengthy street excavation for service connection, but not nearer than every other lot line.

The manholes to be installed at street corners as far as possible. One set to be for all high-tension wires and the other set for low-tension wires. The high-tension manholes to be of sufficient size to contain transformers and other devices as only low-tension wires are to enter the distributing system. Cable in all manholes and handholes to be systematically installed on insulating hangers or shelves.

A system of regular inspection of manholes and handholes should be enforced.

A system as outlined above would do away with the objection raised by Referee Hancock in the case of the Bell Telephone Company versus the City of Rochester, and which was decided in favor of the company last April. The court held in that decision that it was dangerous to place high and low-tension wires in the same conduit system with same manholes under the conditions as they exist in Rochester. The court stated, however, that "No hard and fast rule can be laid down on this particular branch of the controversy. Circumstances and conditions alter cases." This qualification should always be mentioned by the City Electrician when they have the case of Rochester presented to them, as it always will be when the cry of danger is raised by the telephone company.

In conclusion upon this point, I would say that it is perfectly proper to consider, should you so care to, that the proposed system outlined is a double system of separate conduits, one for the

high and one for the low-tension wires, and with the respective ducts imbedded in a three-inch concrete cement and entering separate manholes. Any unbiased person would have to admit this, and I believe that the corporations could not convince any court to the contrary.

Having considered the engineering features of joint conduit occupation, I would like to say a few words regarding the economic features.

It is a fundamental rule of economics that the paralleling of railroads is an economic wrong, and it is just as true in regard to conduit duplication. It is further true that all revenue received by any semi-quasi-public utility corporation is derived from the general public. Consequently, any increased cost of construction will call for increased revenue, which has ultimately to be paid by the public. No one will deny that several conduit systems will cost considerably more than an equivalent capacity in one conduit system.

Joint use of conduits is equivalent to saying that there shall be only one conduit system, and that laid out at one time. The advantages are these:

Decreased cost of construction, and therefore more general adoption of conduit.

Owing to less cost of construction, subsidiary underground distribution can be made, instead of the present overhead distributing system.

Decreased cost of operation.

Economy of the sub-surface requirements of our public streets, which are fast being monopolized.

Prevention of the repeated digging up of our streets,

In concluding my paper, I would say that, regarding the ownership of such conduits, I believe in the conclusion reached by the two electrical commissions appointed by Washington, D. C., and Baltimore, that the ownership should be by the public. A commission appointed by the Massachusetts Legislature in 1897 to report on the street railway problem came to this important conclusion: "The ultimate full control of the street and exclusive ownership, whatever may be the part of its surface, by the municipality is, it may be said, now accepted in European countries as a fundamental principle of policy."

We see, therefore, that conduits as a public utility of a permanent nature of construction, requiring no operating department for their maintenance, are therefore especially adapted for municipal ownership.

INDIANA MUTUAL CONVENTION

AT Indianapolis on October 14th, the Indiana Mutual Telephone Association will hold its annual convention. The meeting will be called to order at 10 o'clock, but the place has not as yet been selected for holding the convention. This will be announced later. An interesting program has been arranged for the 14th, in addition to much important business which will come before the association. Prominent telephone operators from all over the State will be present, and many of them have promised to make addresses.

The officials of the New Telephone Company and the New Long Distance Telephone Company, of Indianapolis, will entertain the delegates during their stay in Indianapolis, and some special features have been arranged for the night of the 14th.

L. A. Frazee, president of the association and H. B. Gates, secretary, announce that arrangements have been made with the railroad companies for a rate of one fare for the round trip from all near points. Independent telephone interests in Indiana are gratifyingly prosperous these days, and from all indications this convention promises to do lots of good, and be a very large and enthusiastic one, both in attendance, and results achieved.

TELEPHONE CABLE FROM LONDON TO BELGIUM

THE telephone cable which crosses the North Sea between St. Margaret's, near Dover, and La Panne, a watering place in Belgium, has been completely laid and the communications with London have been completed. In a few months it is hoped that direct telephonic communication will be established between London and Brussels. When the line is open the public will be able to correspond with Brussels from their own houses without having to go to a cable office, but this will apply to subscribers of the Post Office telephone system only. The charge will be \$2 for three minutes.



New Companies

PUEBLO, COLO.—Hon. F. M. Marriott, of Ohio, representing the Harrison Construction Company, of which he is vice-president, is here making preliminary arrangements for the organization of companies to construct and operate Independent telephone systems in the cities and towns of Colorado. He has interested some local people, and a company has been incorporated under the name of the Pueblo Telephone Company, with O. H. P. Baxter as president, J. N. Carlile as vice-president, with Andrew Park and Judge J. E. Rizer, of Pueblo; H. P. Lillibridge and Richard J. Bolles, of Colorado Springs; W. P. Harrison, of Cincinnati, O., president of the Harrison Construction Company, and Sim A. Bear, of the American Electric Telephone Company, of the board of directors. Application will be made for a franchise, and construction work will begin as soon as the necessary rights are granted. The company intends to invest not less than \$200,000 here. The maximum rate for business telephones is to be \$60 per year and for residence \$36.

MONROEVILLE, IND.—The Monroeville Home Telephone Company has been incorporated with a capital stock of \$10,000.

RUSSIAVILLE, IND.—Plans are on foot for a new telephone system to be constructed here by a local stock company. A central exchange will be constructed and connections established with Forest, Frankfort, Middlefork, New London, Kokomo, and other towns. A party line service will also be established, running through the rural districts.

NORTON, MASS.—The Farmers' Mutual Telephone Company, of Bristol County, has been organized, with A. M. Round, president; A. H. Sweet, treasurer. Capital, \$10,000.

FOWLerville, MICH.—Fowlerville business men propose to organize a co-operative exchange.

ARMSTRONG, MO.—Citizens here are taking subscriptions for the organization of an Independent telephone company.

ELKO, NEV.—The Elko Telephone and Telegraph Company has been organized with a capital stock of \$40,000.

BOSTON, N. Y.—Preparations are being made here to organize a local telephone company to build a line between Boston and Hamburg, with local capital to back it. The line will probably connect with the Frontier Telephone Company at Buffalo.

CHURCHFIELD, N. Y.—Disgusted at the methods of the Bell Telephone Company, local citizens have taken the initiative in organizing a telephone company, securing franchises and constructing a system. The Rochester Telephone Company will be requested to run a line here for long-distance connections.

GENESEE, N. Y.—A company has been organized here for the purpose of constructing a telephone line from Eleven Mile to this place. The officers of the company are John Hart, president; D. A. Tormey, secretary; J. W. O'Donnell, treasurer; John Hart, Dennis McGinnis, D. A. Tormey and William F. Coyle. The line will be built immediately.

TROY, N. Y.—The Northwestern Telegraph and Stock Company has been incorporated, with a capital stock of \$40,000, to build telephone lines between New York City, Philadelphia, Memphis, Chicago, St. Louis, San Francisco, Montreal, and other cities. Directors: Michael J. Duffy, Peter Curley, Thomas Hendrickson, John Drummond, Ferdinand A. Winkler, John P. Killoran and James J. Meagher, of Troy.

AURORA, N. C.—The Washington and Aurora Telephone Company, of Aurora, has been incorporated with \$1,050 capital and the right to increase to \$25,000. H. A. Swindell, Robert Griffin, and others, were the incorporators.

COLUMBIA, N. C.—The Alligator Telephone Company, of Columbia, has been incorporated with a capital stock of \$25,000. The company is empowered to operate telephone lines in this and other States of the Union. The incorporators are W. P. Jordan, Jr., of Norfolk; J. W. Sykes, of Columbia, and Mark Aydtlett, of Columbia.

GASTONIA, N. C.—The Piedmont Telephone Company has been incorporated with a capital stock of \$11,000. N. B. Kendrick and others are stockholders.

VALLEY SPRINGS, S. DAK.—The Valley Springs Telephone Company has been incorporated with a capital stock of \$10,000.

Financial

LAFONTAINE, IND.—The Lafontaine Telephone Company increased its capital stock to \$15,000.

LEBANON, IND.—The Lebanon Telephone Company has increased its capital stock to \$30,000.

ROLAND, IA.—The Roland Mutual Telephone Company has increased its capital stock to \$2,000. Extensions of its limits will be made beyond Roland.

FALL RIVER, MASS.—The Fall River Automatic Telephone seeks to unite working lines of this city with New Bedford, and has issued \$50,000 bonds.

MARION, O.—The Marion Telephone Company has increased its capital stock from \$100,000 to \$250,000.

SAN ANTONIO, TEX.—The San Antonio Telephone Company held its annual stockholders' meeting here, a number of the large stockholders coming down from the North to attend the meeting. The president submitted a statement showing the business done the past year and the present mechanical and financial condition of the company. The statement was a very satisfactory one in all respects, and the stockholders were more than pleased with the results of the investment. An extensive addition to the plant was advised by the president on account of the heavy and increasing demand for telephones, and the president was instructed to make the extension at once. A dividend of 4 per cent, payable quarterly, was ordered. The following directors were elected for the ensuing year. H. M. Daugherty, president; Z. B. Campbell, vice-president; F. Herff, Jr., treasurer; D. W. Gay, secretary; J. S. Brailey, H. M. Aubrey, Oliver Gay, D. A. Walker, G. B. Tallafarro, L. J. Hart, C. L. Allen, W. B. Richie, John C. Rorich, C. M. Haskell.

Rates

MENASHA, WIS.—The Wisconsin Telephone Company has increased its toll rate between this place and Milwaukee.

Elections

CARMI, ILL.—About two weeks ago steps were taken toward incorporating the telephone company formerly known as the White County Telephone Company. At a recent election the following new officers were chosen: T. H. Land, president; G. P. Hanna, secretary, and John C. Stokes, treasurer. The new organization is to have a capital of \$9,000, and will do business only in White County.

PITZER, IA.—The Farmers' Mutual Telephone Company held a meeting here to elect new officers. The election resulted as follows: President, J. G. Beck; vice-president, J. F. Junkins; secretary, Walter Sawhill; treasurer, C. H. Devault; director of line No. 2, C. P. Cline; director of line No. 3, John Atcheson; director of line No. 4, William Forbes; director of line No. 5, William Mitchell. A proposition for an exchange with the Dexter Mutual was read and discussed and finally laid on the table for further investigation.

BUFFALO, N. Y.—The following directors have been elected for the Frontier Telephone Company for the ensuing year: Irving A. Stearns, Henry H. Persons, John B. Weber, H. D. Kirkover, Alvan Markle, E. C. Lukin, Austin Scranton, Charles B. Hill, William A. Douglass, James M. Thomas, Charles E. Austin, Martin Carey, Fred R. Green, Charles W. Goodyear and S. E. Wayland.

SERGEANTVILLE, PA.—The Farmers and Merchants' Telephone Company has reorganized, with the following officers: William Strouse, of Sergeantville, president; W. C. Gebhardt, of Clinton, secretary; Charles N. Reading, of Frenchtown, treasurer.

Franchises

SAN BERNARDINO, CAL.—At the sale of a telephone franchise which was authorized here C. F. Guthridge, representing the Home Telephone Company, of Los Angeles, bid \$200, which he subsequently raised to \$1,072.50. C. W. Grow, representing the San Bernardino Power Company, bid \$1,300, and deposited that amount with the city officials. The

THE WEEK'S MESSAGES *Continued*

franchise was then sold to him. What his company proposes to do with the franchise is wholly problematical.

WILMINGTON, DEL.—The Delmarvin Telephone Company, of Wilmington, has secured the right of way over the Kennett turnpike, and will have connection with Philadelphia.

MACOMB CITY, ILL.—The Illinois Western Telephone Company has asked for a franchise to construct and operate a telephone system in this city.

NOKOMIS, ILL.—The People's Mutual Telephone Company has been granted a twenty-year franchise to operate a telephone system here.

SOUTH OMAHA, NEB.—The local Independent telephone company will again ask the City Council for a franchise here. In the event that this request is denied the company will submit the franchise proposition to the voters here at the fall election.

MONTOUR FALLS, N. Y.—The Century Telephone Company has been granted a franchise here. It has completed its line from Watkins.

FARGO, N. D.—The petition of E. H. Moulton, E. E. Webster and F. H. Curtis for a telephone franchise here has been placed on first reading. If the franchise is granted, it is the purpose to construct an exchange here and give toll connections with all the cities and towns in this State having Independent companies.

FLEETWOOD, PA.—The Pennsylvania Telephone Company has been granted a franchise to construct and operate a telephone system here.

DALLAS, TEX.—It is reported that another telephone company will soon apply to the Council for a franchise. The promoters of the enterprise are connected with a telephone company, it is reported, that is already well established.

DENTON, TEX.—The City Council has refused the Southwestern Telegraph and Telephone Company a franchise for putting in a local telephone exchange in this city.

MANNINGTON, W. VA.—The Augusta Telephone Company has been given a franchise here.

Combinations

MENA, ARK.—The Mena telephone system has been sold to the A. J. Kizer Telephone Company, of Texarkana, owners of the long-distance system between Texarkana and Kansas City. Mena subscribers will now have connection with all towns on the long-distance line.

CHURUBUSCO, IND.—A scheme is on foot for the consolidation of the Independent telephone exchange at South Whitney, Columbus City and this place.

COON RAPIDS, IA.—A. Dixon, proprietor of the Dixon Telephone and Electrical Company, sold both his plants to the Coon Rapids Telephone and Electrical Company, they having also bought the Harris-Jewell Company's telephone line which is being built at this place, the poles being already set. Messrs. A. Harris and H. E. Jewell, and others of the Harris-Jewell company, together with other prominent business men not connected heretofore, are the incorporators of the new company. It is understood the reason for this consolidation is that the two companies would cut rates and thus make profits too small to further extend and otherwise improve the lines. The new company will at once make extensive improvements, running the line in all directions from this place.

GRAND RAPIDS, MICH.—The Citizens' Telephone Company, of this place, has bought the Missaukee County exchange, which includes the exchanges at Cadillac and McBains.

WELLSBURG, W. VA.—Negotiations are pending for the sale of a controlling interest in the Wellsburg Telephone Company to outside capitalists. Assurance is given that the new owners are in no way connected with the Bell company, and many improvements in service are promised. The present officers of the local company will, it is said, be retained in charge of the business here, and outside connections will be greatly extended. The home company was formed some four or five years ago, and has always had the bulk of the local business.

Underground

PARK RAPIDS, MINN.—The Village Council has passed an ordinance requiring all companies to cable overhead wires, or, if not cabled, to put them underground. This regulation is to take effect at once.

PORTLAND, ORE.—It is expected that City Council will take action for the placing underground of all electric light, telephone and electric wires in the city.

NARBERTH, PA.—The Borough Council of Narberth has granted the Delaware and Atlantic Telephone Company the right to open the borough streets for the purpose of laying its wires underground.

RICHMOND, VA.—The Richmond Telephone Company has asked City Council for permission to put its wires underground.

Construction

GIBSON, ILL.—The Gibson Telephone Company has received new poles, and will soon erect new country lines. A line will be run southeast into the Farmersville country.

MOBILE, ILL.—A lively telephone fight is on in Moline and Rock Island. A resolution has been adopted by the Moline City Council condemning the Central Union Telephone Company for its poor service and for its refusal to grant the demand of the striking telephone girls for \$1 a day. They are now paid on an average of \$15 a month. Public sympathy is strongly with the strikers. The company's franchise has expired, and hereafter it will be compelled to pay or vacate the streets. The Union Electric Telephone Company is installing an up-to-date system, with underground conduits, etc., is erecting a central office building, and will pay 2 per cent. of its gross earnings into the city treasury.

ROCK ISLAND, ILL.—Manager Fitzgerald, of the Union Electric Telephone and Telegraph Company, announces that the telephone system being installed by his company will be in operation in this city sometime during the early part of November. Nearly all the underground conduits have been laid, and the big spools of cable are being received and distributed about the city, where they will be used. The poles in the outlying districts are nearly all in place, but no wires are strung. The central office is being put up as rapidly as possible, and it is to be completed by October 1, so that the installing of the apparatus can be started.

DELPHI, IND.—The Carroll Telephone Company has arranged for the reconstruction of its entire plant, the improvements amounting to about \$15,000.

NEW ALBANY, IND.—A new switchboard, with a capacity of 4,800 lines, is being placed in the Home telephone exchange building. As soon as the work is completed the system will be connected with the Louisville system.

NEW CASTLE, IND.—The new Independent Telephone Company now has 170 telephones in working order, and is rapidly completing the plant. All the cables have been connected, and 500 feet additional put up. The company hopes to have the plant entirely completed in 30 days.

NEW PARIS, IND.—The local telephone system is being extended by the building of several short lines to supply an urgent demand for service by farmers in several localities.

WAKARUSA, IND.—The Wakarusa Telephone Company has decided to extend its line to South Bend. It will also establish a county line, and may install an exchange at Clayville. Work on the new line will begin as soon as possible.

WINCHESTER, IND.—Within a very short time the Eastern Indiana Telephone Company, organized and capitalized in this city, will complete a copper circuit to the city of Muncie.

FINCHFORD, IA.—A farmers' telephone line is being built here.

MARENGO, IA.—The Iowa Telephone Company is constructing a new line from Marengo to Sigourney.

EAST HEBRON, ME.—The Hebrons' Home Telephone Company will construct a line from East Hebron to Hebron Academy.

LOWELL, MASS.—The Water Board of this city is making arrangements to install a private telephone system for its exclusive use.

PARK RAPIDS, MINN.—The Central Minnesota Telephone Company has commenced a complete renovation of the Park Rapids exchange. The right of way has been secured along the Great Northern Railway, and the long-distance lines will be run parallel with the railroad.

NORFOLK, NEB.—The telephone exchange here will soon install a new 500-drop switchboard. The 300-line switchboard now in use has long since been outgrown, and the new board is a necessity.

GALLUP, N. M.—A telephone line will be constructed from here to Wingate, and also one to Fort Defiance.

CLINTON, N. Y.—M. S. Powell, manager of the Clinton Home Telephone Company is constructing a first-class line to Crow Hill, Chukery and Paris Hill. At the last meeting of the board of trustees permission was given Mr. Powell to place his wires underground in the business portion of the village. This will be done a little at a time. Right of way has been secured along the old canal toward Utica, and a first-class long-distance line will be built in a week or two, with copper circuits, connecting with the new Home telephone company, of Utica, giving all the subscribers of the Clinton Home Telephone the direct connection to Utica, as they now have to Waterville, Rome, Syracuse, and other towns.

ILION, N. Y.—S. C. Newton and Mr. McMullen, of the County telephone line, are repairing the Ilion and Cedarville line.

ELMIRA, N. Y.—The Century Telephone Company expects soon to have its toll service in operation in this vicinity. About Corning the work is being actively carried on, and by November 1 communications are expected to be established between Corning and Towanda, Pa., on the east, and Friendship on the west. At Elmira the line will go over East Hill to

THE WEEK'S MESSAGES *Continued*

Wellsburg, down to Waverly, Sayre and Athens. The poles and cross-arms are already in position, and much wire has been strung. The toll line between Ithaca and Cortland is finished. A gang of men is now at work laying the wires between Freeville and Ithaca, and the line between Cortland, Dryden and Freeville has already been completed. The toll lines between Ithaca, Watkins and Lansing will be finished in thirty days.

NEWARK VALLEY, N. Y.—Linemen are making long promised repairs on the line from this place. The old wire to Flemingville will be taken down and a new copper wire will be put up from the village over the west hill to join the copper line on West Creek.

OSWEGO, N. Y.—The Empire Telephone Company will spend about \$10,000 rebuilding its service in this city. New instruments are to be provided for all subscribers.

PHELPS, N. Y.—The Inter-Ocean Telephone Company is setting poles for a line through this place.

DEFIANCE, O.—Defiance capital and business men are interested in the construction and operation of another telephone system in the State of Indiana. An exchange is being erected at Gas City and one at Jonesboro, Ind. The Buckeye Construction Company has the work in hand and is building the systems in both places under the supervision of K. V. Haymaker. The work of erecting both plants is progressing rapidly, and it is expected that both will be ready for operation by early spring.

GALION, O.—The Galion Telephone Company has begun its work of rebuilding the cable plant, and has a large force of men on the job. The work will be rushed as rapidly as possible to completion.

NEWARK, O.—The Newark Independent Telephone Company, which is now rebuilding its entire system at an expense of nearly \$50,000, is installing a new central-energy switchboard. The new pole lines are set and a part of the cable to be used on the new system is here. It will be December 1 before the new system is entirely completed.

ABBOTTSTOWN, PA.—There will soon be direct telephone connections between this place and York. Work is in progress on the line between here and Farmers.

FOREST CITY, PA.—The Northeastern Pennsylvania Telephone Company will connect with the Citizens' company, giving them entrance to Honesdale.

HONESDALE, PA.—Two more telephone wires are being placed on the poles between this place and Carbondale.

INDIANA, PA.—The Indiana Telephone Company has decided on a number of improvements, including a full metallic circuit for all its lines. Connection with the Farmers' telephone line is being made at Creekside. The new trunk line connecting with the Johnstown system has been completed.

M'KEESPORT, PA.—The Federal Telephone Company will soon connect this place direct with all its other lines in Wilmerding, Washington, Canonsburg and other important towns. Next spring the Federal company will start work on the underground system here.

OAK HILL, PA.—The Delaware and Atlantic Telephone Company is extending its line into Oak Hill and Garrettford.

TITUSVILLE, PA.—On account of the large increase in its business, the Union Telephone Company is making improvements and enlargements to its system here.

WILMERDING, PA.—The Federal Telephone Company is making new connections between Wilmerding and Wilkinsburg, and expects soon to have arrangements made for Pittsburg service. The company is being represented in Wilmerding by the Eastern district manager, Henry Bennett, who is making a canvass of the borough with the object of largely increasing the number of local telephones. The company's lines now surround Pittsburg, in Allegheny, Beaver, Westmoreland, Fayette, Washington and Butler counties, with exchanges in all the larger places.

WAVERLY, TENN.—A telephone line to Danville from this place will be put up in the near future. Dr. M. R. Horner and C. M. Cooley, of Clyde, and others, have the matter in hand.

M'KINNEY, TEX.—A telephone line is being constructed between this place and the new town of Frisco, on the Frisco railroad, in the western part of the county.

NORTH YAKIMA, WASH.—H. L. Brown, representing the Christian Co-Operative Telephone Company, of Sunnyside, is here, making arrangements for the extension of the line to this place. The company recently got a franchise to do business here.

TACOMA, WASH.—The Northwest Telephone and Telegraph Company, which has franchises for constructing lines in western Washington, will resume work here soon. H. V. Perry, assistant general manager of the company, says bonds to the extent of \$400,000 have been subscribed by a New York syndicate.

UNION, W. VA.—The Craig Telephone Company is putting in a telephone system which will connect nearly all sections of Craig County. The line is now being constructed to Simmonsville. J. W. Troutt is president of the company.

SUN PRAIRIE, WIS.—H. E. Kepler, secretary and manager of the Interurban Telephone Company, says many new lines will be built by his

company in the near future. The company has just finished many important lines, and is now building one from Lake Mills to Fort Atkinson.

Miscellaneous

GADSDEN, ALA.—The telephone line between Gadsden, Alabama City and Attala has been completed.

APPLING, GA.—The Grovetown telephone line is completed to this place.

MOLINE, ILL.—The rumor that the Union Independent Telephone Company will install an automatic switchboard at the central office has been denied by Manager Fitzgerald.

TOULON, ILL.—The stockholders of the Stark County Telephone Company will hold their annual meeting here for the transaction of necessary business.

PERU, IND.—The entire system of the Home Telephone Company has been rendered useless by fire that started from a candle burning the main switchboard.

ASHTON, IA.—It is reported that an automatic telephone exchange will be installed here.

TOPEKA, KAS.—Twenty-five towns in northeastern Kansas have been connected by long-distance toll lines with the Independent telephone system of Topeka. The list includes the city of Atchison, with 1,200 telephones in use. Leavenworth will be connected with the Topeka exchange upon the completion of the work of stringing six miles of wire. All the lines are metallic circuit. The list of twenty-five towns just added includes Atchison, Oskaloosa, Valley Falls, Effingham, Nortonville, Meriden, Lancaster, Cummings, Winchester, Denison, Rock Creek, Osawkie, Tonganoxie, McLouth, Dunavan, Muscotah, Jarbalo, Reno, Ackerland, Boyle Station, Easton, Birmingham, North Cedar, Hawthorne and Parnett.

BOSTON, MASS.—The American Telegraph & Telephone Company instrument statement for the month ended September 20 and since Dec. 20 shows:

	1902.	1901.	1900.
Gross output.....	75,011	75,578	44,190
Returned	43,334	33,482	30,948
Net output.....	31,677	42,096	13,242
Since Dec. 20:			
Gross output.....	808,334	683,171	501,354
Returned	346,689	301,289	220,903
Net output.....	461,645	381,882	280,457
Total outstanding.....	2,987,251	2,334,698	1,860,956

FENTON, MICH.—The Union Telephone Company, which has completed its line to Fenton, has gone through to Holly and made connection with the Oakland County Mutual. The headquarters of the Union company are at Alma, and it has a capital stock of \$400,000, of which \$375,000 is paid in. Connection with Detroit will be effected as soon as possible.

QUINCY, MICH.—A local exchange is in operation here with about 75 subscribers.

HUTCHINSON, MINN.—The Hutchinson Telephone Exchange Company has moved into its new headquarters. The company now has over 200 subscribers connected and many more on its books who cannot be accommodated because the necessary supplies cannot be gotten by the company.

ST. LOUIS, MO.—The Kinloch Telephone Company has filed the necessary papers enabling it to do business throughout Indiana, Illinois and Ohio.

COLTON, N. Y.—The telephone line which is being put in from here to Pierpont is nearly completed, and also the line which is being put in by Mr. Robinson, of Potsdam.

HECTOR, N. Y.—The Hector Telephone Association now has its line in operation between here and Logan.

LENA, N. Y.—The New Lisbon Telephone Company has its line up through here, comprising about 23 miles finished. The farmers find it a great convenience.

PULTENEY, N. Y.—The Empire State Telephone Company has completed its line from Kinney's Corners to the end of Bluff Point.

TOWNSEND, N. Y.—The telephone line is now in working order, with instruments installed at both Beaver Dams and Townsend.

NEWARK, O.—The Newark Independent Telephone Company, which is rebuilding its plant at a cost of nearly \$50,000, has just secured a long lease on a building for a central office. The new central-energy switchboard will be installed there. The system will be in operation by December 1.

PIQUA, O.—The Home Telephone Company, of Piqua, is said to be growing steadily, and another switchboard for the exchange is contemplated.

JOHNSTOWN, PA.—The Johnstown Telephone Company has opened up connections with the Cambria County Telephone and Telegraph Company's new line to Barnesboro, Hastings, Spangler and Nicktown, in the

THE WEEKS MESSAGES *Concluded*

north of the county, and connections will shortly be made with the line to Carrolltown and Patton.

WEST GREEN, PA.—Plans are being prepared for the construction of a farmers' mutual telephone line in Green Township.

CAMPBELLTON, TEX.—A waterspout which came upon this city recently has entirely destroyed all telephone lines in this vicinity.

GLOUCESTER COURTHOUSE, VA.—The stockholders of the Tide-water Telephone Company held their annual meeting here. The superintendent's report showed that the company was in a prosperous condition and had done considerable construction work and improvements during the year. The following board of directors was elected: W. A. Withers, president; J. W. Down, J. A. Bristow, J. L. Taliaferro, I. B. Weaver, Josephus Trader and W. W. Allmond, vice-presidents.

FAIRMONT, W. VA.—The general offices of the Consolidated Telephone Company have been moved from Clarksburg to Fairmont. Mr. J. Walter Barnes, the new manager, will make this city his headquarters.

Personal

INDIANAPOLIS, IND.—Edgar Burgess, formerly with the Harrison Telephone Company, has accepted a position with the New Long-Distance Telephone Company.

SEBREE, KY.—Norris Allen has been appointed manager of the Sebree Independent Telephone Company.

CADILLAC, MICH.—Fred Kooyers has been appointed manager of the Cadillac exchange, which was recently taken over by the Citizens' Telephone Company. Mr. Kooyers was formerly an inspector in the Grand Rapids office and had been in the employ of the company for five years, almost since it was first started. His appointment, therefore, comes as a promotion.

GENEVA, O.—J. C. Terwilliger has handed in his resignation as manager of the Madison Telephone Company, having exchanges at Geneva, Madison and Perry, which he accepted early last spring, coming here from Columbus.

BLOOMSBURG, PA.—W. H. Balsley, of Philadelphia, has been appointed manager for this district of the United Telephone and Telegraph Company.

AUSTIN, TEX.—Col. W. B. Wortham has been elected vice-president of the Independent telephone company of this city by the stockholders and directors.

TRADE NOTES

THE STANDARD VITRIFIED CONDUIT COMPANY has closed a contract with the city of New Castle, Pa., for a complete municipal conduit system. This contract calls for about 300,000 feet of multiple duct, vitrified salt-glazed conduit of the very latest pattern manufactured by the Standard company. Mr. Robert W. Lyle, president of the company, has recently taken out several patents on lock keys for conduit section joints, which have been abstracted in the AMERICAN TELEPHONE JOURNAL. These lock keys are a distinctly radical departure in conduit construction. The New Castle system will be equipped exclusively with the new conduit embodying this feature, and will be the first installation using the device. The Standard company has orders booked ahead for about four months' supply of its factories, including systems for the following: Bell Telephone Company, Atlanta, Ga., and several other cities in the country; conduits for Baltimore, Md.; Mobile, Ala.; Richmond, Va.; Clarksville, Tenn.; Catskill, N. Y.; Worcester, Mass., and the Niagara Falls Power Company, Niagara Falls, N. Y. Messrs. Regan & Mullock, of Philadelphia, well-known conduit contractors, have the contract for laying the conduit system for the New Castle municipality.

THE CENTRAL TELEPHONE AND ELECTRIC COMPANY, St. Louis, Mo., has established a sales office in Chicago, Ill. This office is at No. 59 West Jackson Boulevard, and is in charge of Mr. C. E. White. He has a full line of samples and facilities for taking care of any orders in that locality to good advantage.

THE ADAIR & RUSSELL TELEPHONE COMPANY has very much improved the service of its toll line by putting in new Stromberg-Carlson bridging telephones and repairing its line up in good shape.

MR. G. M. GEST, the conduit contractor, of New York and Cincinnati, has been awarded the contract for all the underground conduit work to be installed by the Brooklyn Heights Railroad Company this season. This contract amounts to over \$25,000.

PLANTS FOR SALE

FOR SALE at appraisalment, all or part interest in a Telephone line of 135 subscribers, paying 7 per cent. on cost price. Good chance for extensions. SEA SHORE TELEPHONE COMPANY, Point Pleasant, N. J.

FOR SALE—One of best equipped telephone exchanges in Kansas; price, \$22,000; upon which amount plant now NETS 23 per cent. If you mean business, address X for particulars, care of AMERICAN TELEPHONE JOURNAL, New York.

TELEPHONE PLANT FOR SALE—160 telephones, 100 miles of toll lines; excellent opportunity for extending business; will sell for \$12,000; pays 15 per cent. net on this amount. Address TELEPHONE CO., care of AMERICAN TELEPHONE JOURNAL.

WANTED

POSITION as assistant manager of exchange of 100 or 200 subscribers, or as inspector. Best of references furnished. Address T. C. B., care AMERICAN TELEPHONE JOURNAL.

POSITION as superintendent or manager in telephone system, either on line or in exchange, by a young man of strictly temperate habits. Best of references as to character and ability. BOX 145, care AMERICAN TELEPHONE JOURNAL.

POSITION as wire chief in central energy exchange of from one to two thousand subscribers; 9 years' experience; best of references. A. B., care AMERICAN TELEPHONE JOURNAL, New York.

A HOME IN SOUTHERN CALIFORNIA—I desire to communicate with a man capable of taking charge of a factory for insulating rubber-covered National Code wires. This is a splendid opportunity for the right man. References given and required. No money necessary. Address P. O. BOX 1116, Los Angeles, Cal.

POSITIONS as linemen by two experienced workmen. Would prefer construction work in Michigan or nearby State. Address R. M. M., care AMERICAN TELEPHONE JOURNAL, New York.

POSITION as foreman or superintendent with telephone or construction company. Twelve years' experience in telephone construction work; best references furnished. Address J. W. S., care AMERICAN TELEPHONE JOURNAL, N. Y.

POSITION in an exchange of 100 to 500 subscribers, as manager or assistant manager. Experienced in construction and switchboard work; references furnished. Address EVAN PAUL JONES, North Vernon, Ind.

EXCLUSIVE handling of an account, for Chicago trade, beginning January 1st. Manufacturers Agency basis. Address SALESMAN, care AMERICAN TELEPHONE JOURNAL, Monadnock Building, Chicago.

STEADY position as troubleman. Thoroughly understand switchboard, line and instrument work; five years' experience. Address C. R. SAVAGE, Lebanon, O.

EXPERIENCED telephone traveling salesman; acquaintance with Northwest trade preferred, but not essential. Address THE VOUGHT-BERGER COMPANY, makers of telephones and switchboards, La Crosse, Wisconsin.

POSITION by a competent and experienced salesman of electric light, telephone and street railway material, by a young man with 14 years' experience in this business; best of references. Address L. C., care AMERICAN TELEPHONE JOURNAL.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISSELL CO., Toledo, Ohio.

POSITION as manager or superintendent of small exchange; at present in charge of small exchange; 31 years old; married; strictly temperate; references furnished. Address A. B. C., care AMERICAN TELEPHONE JOURNAL.

The American Telephone Journal

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FINANCES FROM AN IOWA STANDPOINT

By C. F. BENNETT, WATERLOO, IOWA

VIEWED superficially, the financial status of the average telephone company is an alluring proposition to the investor. Viewed critically, it is not necessarily so. The superficial view is this: Lines and exchanges are built, which net the owner 30 per cent on first cost of construction. With small investments this is usually true. The critical view, however, reveals that after the first five years, in most cases, experience has necessitated such changes that the first expenditure is valueless, save as it represents franchises and business interests. Then is required another and new investment which takes as much money as though the original plant had never been constructed, so that the first investment which seemingly was quite profitable, in fact paid only 10 per cent, and that consisting of a new enterprise by new men, which was by no means a safe experience from a prospective point of view.

But what of the new investment referred to? What is its showing to be? The answer to this is peculiar. Telephone investments made after the knowledge comes of how to build to supply the demand will profit or not only in proportion to the business ability of the management, and it matters not what one may do or show, it will be no criterion for another which would assume to pursue radical and untried business methods—and many of the most successful telephone methods of the future will have been in the past radical and untried.

I have answered the question as to the investment properly made and as most of the present plants now exist. The management without ability would be superceded by another, until all plants would be good properties, as we are able to-day to say railroads as a rule are good properties. In support of the foregoing, I could give you figures which are explanatory and conclusive. It would not be appropriate here so to do, neither would the figures or illustrations be entertaining. It is conclusive, however, that the demand is enormous, that the good management will in time succeed and the poor management in time fail. The average will be profit, for the stability and values of like enterprises are no longer problematical. There are instances to be found where the facts and figures in the accompanying table will apply:

These figures bring out quite prominently four things: First, the small plant shows a larger per cent of profit than a larger one. Second, it takes money to make up for a lack of knowledge that the people will all be users of the telephone. (I say all; we will see a telephone in most households in America.) In the tabulated instance \$30,000 was expended for this information. Third, a system of lines should come down to a net showing of about 20 per cent, of which a certain part must be set aside for depreciation, which will vary from 2 to 10 per cent, and in this feature comes the test of the business. It is that rates and expenses, by good management, will be so controlled that 20 per cent of net will result. And this net must be retained as near itself as possible by owning properties so well built and so well and economically preserved that the depreciation will be at the minimum. If this is then 2 per cent, the net is 18 per cent. If 10 per cent, the net is 10 per cent. Now, with careful attention to rates and methods, it will be possible to keep the net incomes from good lines up to the 20 per cent. But neglect is liable to cut this to 12 per cent or 15 per cent. This latter, coupled with poor construction and the corresponding 10 per cent depreciation, would leave only 2 or 5 per cent net, which is the result found in the percentage of all poorly managed enterprises. Fourth, the earnings of a well-built plant are less in proportion to the cost of construction than a poorly built plant.

There are other methods of making profit in the Independent telephone business than that true test applied heretofore, which

is the test of the operating company. This other method consists in building of light construction a plant or plants costing, say, \$10,000. This starts out to make a showing of a high earning capacity. Then the stock company is formed and the outfit turned in for \$25,000, say, of paid up capital stock, and then the promoter turns in and sells to the investing public, usually in small lots on the Street, all but a controlling interest for enough or more to pay the first cost, leaving the manage-

Investment	1896	\$10,000
Earnings	1896	8,000
Expenses	1896	3,000
Net		5,000
Investment	1897	25,000
Earnings	1897	17,500
Expenses	1897	7,500
Net		10,000
Investment	1898	50,000
Earnings	1898	25,000
Expenses	1898	12,500
Set aside for rebuilding	1898	5,000
Total expense		17,500
Net		7,500
Investment	1899	75,000
Earnings	1899	35,000
Expenses	1899	15,000
Set aside for rebuilding	1899	10,000
Total expenses	1899	25,000
Net	1899	10,000
Investment	1900	100,000
Earnings	1900	40,000
Expenses	1900	15,000
Set aside for rebuilding	1900	10,000
Total expenses	1900	25,000
Net	1900	15,000
Investment	1901	150,000
Earnings	1901	50,000
Expenses	1901	20,000
Set aside for rebuilding	1901	5,000
Total expenses	1901	25,000
Net	1901	25,000
Investment	1902	200,000
Earnings	1902	65,000
Expenses	1902	25,000
Net	1902	40,000

ment in the hands of the so-called promoter, who operates and uses incomes for dividend without reference to depreciation, carrying out a process of depletion which works disaster in a short time.

This is a favorite method of certain contractors who co-operate with friends on the same basis as confidence men and their accomplices, and results attained are the same in one case as in the other. Dividends may run as high as 10 or 12 per cent for five years, but the whole plant at the end of that time will require a new investment.

The true tests of the successful telephone plant are, as it is shown, a series of years of successful operation, not necessarily accompanied by cash dividends to the stockholders, but by the continued development of good patronage, good methods and good men to do the work which must come in the future.

THE TRAVELING INSPECTOR

BY WILLIAM H. HYDE

IN A PREVIOUS article I endeavored to show the importance of a regular inspection of exchange instruments. If a number of exchanges are operated under one management a "traveling inspector" should be employed to visit the different exchanges at regular intervals to see that the inspection work is kept up properly. Unless this is done managers are apt to become careless in their work, and an inspector of this kind is needed to keep an eye on the work done, as the superintendent has not the time to make a personal visit to all the subscribers under his supervision.

It is very important that the man selected for the position of traveling inspector be a tried employe, as the position is a difficult one to fill satisfactorily all around, it being necessary to pick out a man who will take well both with the local managers and with the subscribers.

The traveling inspector's numerous duties may be tabulated as follows:

First—To examine instruments carefully to ascertain if the local manager is keeping them in good condition, and also to see that the instruments are "set up" right, inside wiring neatly done, connections with line wire properly soldered, etc.

Second—To see that line, ground and return wire connections are soldered.

Third—To see that arresters are properly equipped at subscribers' stations and on aerial and submarine cables, cables wired straight, connections soldered, etc.

Fourth—To look out for bridging bell lines and see that no series bells or extension bells are looped on these lines.

Fifth—To test all lines for noises, and report to the superintendent all lines that are unfit for service, so that they may be looked after.

Sixth—To note any extension sets, extension bells, switches, etc., in use at subscribers' stations, for the purpose of checking up the records in the general office to see if subscribers are paying for the extra apparatus.

Seventh—To talk with subscribers and see if they have any grievances, and report any complaints received to the superintendent, and to also inform the local manager each day of any complaints received, so that he can take them up promptly and apply the remedy.

Eighth—To make a "service test" from each instrument and note *time elapsed in getting central in seconds*, and report any delay in the service to the local manager and the time it occurred.

Ninth—To examine the switchboard, crossboard and protectors in the central office and see that all are in perfect condition. See if "busy test" and "cord test" on the switchboard are in working order. See that all connections on the distributing frame (cross-board) are properly soldered. See that the protectors are properly equipped, only *one mica* used between carbons, etc.

Tenth—To see that power generator, or pole changer if used, is in good condition and properly protected by an arrester if outside of the building.

Eleventh—To observe if the office discipline is good. See if any visitors or hangers-on are allowed around the office during the day or night, and report.

Twelfth—To see if any old material lying around the office is not needed; if so, see that manager returns it to headquarters. Inquire of local manager if supplies furnished him are sufficient for his needs. All old zinc and copper junk should be saved and sold. See if the manager is doing this. See if storeroom, where supplies are kept, is neat and clean, tools in good condition, etc.

Thirteenth—See if all dead lines have been taken down, to avoid accidents.

Fourteenth—See if the local manager keeps a "daily trouble sheet" of some kind, showing drop number, name of subscriber, nature of trouble, time reported, time repaired, for reference. Also see that the local manager keeps a *cable record* and *line number record* in book form.

Fifteenth—To make a general report on the exchange to the superintendent, in writing, when inspection is finished, guiding himself by the foregoing in making out the report.

A regular form of inspection slip should be furnished the traveling inspector for his use (see Fig. D). This slip differs

INSPECTION SLIP

.....Exchange 190.....

Subscriber

Location

	CONDITION.	REMARKS.
Bell		
Maker		
Hand		
" No.....		
Transmitter		
" No.....		
Battery		
Cord		
Inside Wiring.....		
Ground		
Line		
Arrester		

TIME ELAPSED

GETTING CENTRAL.....Sec.

DELAYED SERVICE AT.....M.

REMARKS:

.....
.....
.....
.....
.....
.....
.....

.....
Traveling Inspector.

FIG. D.

somewhat from the inspection slip furnished the exchange manager, as it permits the traveling inspector to note what he finds on each slip. The traveling inspector should mail the slips daily to the superintendent, so that he may keep in touch with him. If the above plan is carried out it will be found very beneficial, as the managers are more on the alert and take better care of their exchanges, as they cannot tell when to expect a visit from the traveling inspector. If the managers keep their exchanges up in first-class condition they may be sure of a good report; if not, they must suffer the consequences.

FINANCES FROM A BELL STANDPOINT

THE Philadelphia News Bureau, which makes highly colored and glowing articles on the American Telephone and Telegraph Company one of its specialties, recently printed the following statement, which is reproduced as of possible interest

to readers of the AMERICAN TELEPHONE JOURNAL:

During the fiscal year ended Dec. 31, 1901, American Telephone & Telegraph Co. paid \$5,050,023 in dividends, representing 7.5 per cent. on the stock eligible to dividends during the year. As the

amount of capital stock outstanding at the close of the year was \$82,748,000, the dividend requirements on this amount for the present year will be \$6,206,100. Besides this, the company some time last spring issued \$5,000,000 stock, which is presumably eligible to dividends this year. The \$21,937,000 stock sold to stockholders this year will not be eligible to dividends until after Jan. 15, 1903; but after that date the company will have annual dividend requirements of \$8,226,350.

It will be interesting to note how far the direct earnings of the company will go to meet the new requirements and how far it may be compelled to draw larger dividends from the sub-companies. A larger sum can be drawn, of course, without necessarily increasing the various dividend rates on the stocks of the sub-companies since the latter, as in the case of the parent company, have issued to their stockholders considerable stock for construction. A comparison of the parent company's statements of earnings for the past three years, in which are included the operations of the long distance service, will show how new dividend requirements have been met:

Earnings.	1901.	1900.	1899.
Dividends	\$4,988,207	\$3,846,821	\$3,044,908
Rental of Instruments	2,647,907	2,427,027	1,714,526
Telephone traffic	3,533,446	3,027,071	2,668,359
Real estate	36,680	31,824	42,285
Interest	399,579	201,643	217,301
Miscellaneous	995		
Total earnings	11,606,816	9,534,499	7,687,381
Expenses:			
Administration	\$772,424	\$746,259	\$591,826
Legal	99,138	85,134	103,748
Interest and taxes	1,276,559	1,376,200	1,234,275
Telephone traffic	2,060,409	1,840,847	1,487,021
Total expenses	4,208,531	4,048,441	3,416,872
Net earnings	7,398,285	5,486,057	4,270,508
Dividends paid	5,050,023	4,078,601	3,882,945
Balance	2,348,262	1,407,456	387,563

Thus the parent company has been drawing from its sub-companies dividends almost large enough to meet its own dividend requirements. In the present year this item will probably show another large increase, a portion of which will come from the dividends of the Western Telephone and Telegraph Company,

which is now paying 2 per cent. semi-annually on its preferred. That an increase in dividends from sub-companies is possible, is evident from the statements of output of instruments, which shows a rate of increase large enough to warrant an increase of \$13,000,000 gross earnings for the present year, taking all the companies in the Bell system. In a recent article we estimated that the net earnings of the sub-companies this year will show an increase of over \$3,500,000.

Another item which will show a large increase is "rental of instruments." The statement of output of instruments for July, 1902, shows an increase of 660,000 in total instruments outstanding on that date over July, 1901. Assuming that this will represent the increase for the fiscal year, rentals at one dollar per instrument may be expected to show an increase of about \$660,000.

Interest on bonds will show some increase. The company has issued \$13,000,000 4 per cent. bonds for the purchase of a controlling interest in the Western Telephone and Telegraph Company, which will require \$520,000 per annum. Allowing for a reasonable increase in other items, we may estimate the income account of the American Telephone and Telegraph Company for the present year as follows:

	1902.	1901.
Dividends	\$5,500,000	\$4,988,207
Rental of instruments	3,300,000	2,647,907
Telephone traffic	4,000,000	3,533,446
Other items	450,000	437,254
Total earnings	13,250,000	11,606,816
Expenses of administration	800,000	772,424
Legal expenses	100,000	99,138
Interest and taxes	2,000,000	1,276,559
Long distance expenses	2,300,000	2,060,409
Total expenses	5,200,000	4,208,531
Net earnings	8,050,000	7,398,285

The estimated net earnings for 1902 would be equivalent to a little over 9 per cent. on the stock eligible to dividends this year. This result would be achieved, it will be seen, without any large increase in dividends from the sub-companies other than the dividend on the Western Telephone stock. To meet the dividend requirements on the total stock outstanding after Jan. 15, 1903, the company will, of course, have to depend upon a further increase in dividends from sub-companies, or upon an increase in direct earnings of 1903.

SOME CURIOUS RADIOPHONE PHENOMENA.

CAPT. J. H. CAMPBELL, formerly of the Government steamship *Newfield*, has the honor of having discovered that wireless telephony was possible. The Captain made his discovery several years ago, and it is interesting to recall the fact now that Ruhmer, a German investigator, has found it possible to speak for a distance of about four miles and believes that he can extend the distance to twenty. The facts are that on one occasion the Captain had a party of men ashore doing some work, while the *Newfield* was lying off about a quarter of a mile. The *Newfield* had her searchlight and Captain Campbell discovered that whenever the rays bore directly on the men they could hear what was said on board, and vice versa, and that the instant the light was deflected from them that there was silence.

On another occasion, lying in Arichat Harbor, Captain Campbell observed the same phenomenon. He was from one-quarter to one-eighth mile distant. It was Sunday evening and the people were walking along the road toward church. He could hear the conversation of the crowd quite distinctly so long as the searchlight was directed to them, but not otherwise.

Captain Campbell wrote of his observation to Dr. Alexander Graham Bell, to which he replied at the time, saying it was "marvellous." More recently, in reply to another letter, Dr. Bell wrote Captain Campbell as follows:

"MY DEAR CAPT. CAMPBELL: I remember with great interest the circumstances communicated to me some years ago, either by yourself or by the late Dr. De Wolfe, that you had heard the voices of your men from shore (about half a mile distant) on the rays of the searchlight from the steamer *Newfield*. If I recollect correctly, the voices were audible only when the men on shore were illuminated by the searchlight, and nothing could be heard when the searchlight was turned to one side, and you assumed that the sounds had reached your ears on the rays of

the searchlight. I informed my correspondent at the time that such a result, if established, would be truly marvellous, and that I would like to publish the observation in the scientific journals, and would do so if it was clear that the sounds could not have reached the ear through the air; and, in order to settle this point, I asked my correspondent a question, which, to my recollection, has not been answered, namely, whether the concave reflector of the searchlight was open to the air or closed with glass. If open, there was nothing extraordinary about the observation, because it is well known that concave reflectors act like hearing tubes in increasing the audibility of faint sounds.

"For example, there is a well-known laboratory experiment in which we have two parabolic reflectors facing one another at a considerable distance apart; a watch is placed in the focus of one reflector and a hearing tube connected with the ear in the focus of the other, and under these circumstances the ticking of the watch can be heard when the watch is so far off that the ticking could not be heard through the air in the ordinary way without reinforcement by some artificial instrumentality.

"In the case of the steamship *Newfield*, if there was glass in front of the searchlight, this kind of action could not have taken place, and the audible effects would be then due to the rays of light—a result so extraordinary as to demand investigation. And so the question as to whether there was or was not glass in front of the searchlight is of vital importance, and I should be very glad if you could give me information upon this point.

"I have hitherto published nothing concerning your very interesting observation, because my mind has not been clear upon this point."

There was, Captain Campbell says, glass in front of the searchlight, which would prevent the sounds being transmitted by any other means than by the rays of the searchlight.—*Halifax Daily Mail*.

COMMON RETURN SYSTEMS

By P. KERR HIGGINS

WHERE metallic circuits cannot be had on account of the expense, or for other good reasons, the next best installation is a good "common return system." I must emphasize, however, that the ideal and only perfect system is the full metallic circuit, for the reason that it can be perfectly balanced, whereas the common return cannot. It is true that this system is a kind of metallic but not pure metallic. I may also add there are very few strictly pure metallic circuits in operation to-day; nearly all of the central energy systems have only a kind of metallic circuit, there being a connection to ground through the battery (Fig. 1), and in most of them all

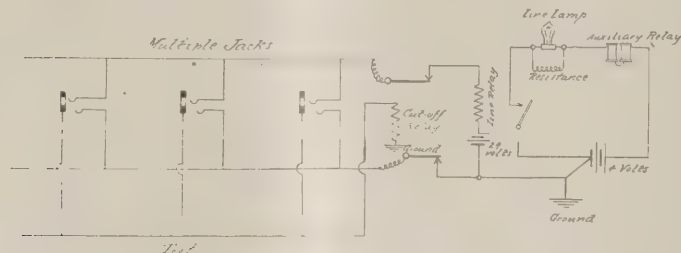


FIG. 1.—Line circuit on central energy board, showing ground connections at battery.

lines are strictly grounded circuits until the operator inserts the plug in the jack. It is possible for one, while waiting for the operator to take the call and having the receiver to the ear, to hear conversations on other lines, due to induction caused by the unbalanced conditions existing. On such systems it is advisable to have the operator take the call at once, even if she cannot answer the call. This is done by inserting one of her answering plugs and leaving her answering key closed until she is ready to answer. By doing this the grounded condition is cut off and a compound metallic effect obtained.

Another difference between a pure metallic circuit and a common return is that there is always a tendency to neglect the condition of the return as to insulation, resistance, etc. In many places it is now practice to ground the common return at the main exchange or at several points. In my opinion, the former method is the better, as it permits of tests being made and it can be taken off and connected up, as is found best. This ground at the central office is found very convenient for eliminating noises or disturbances due to induction, etc. In small exchanges I have found the common return to work very satisfactorily. I made the first test of this character in Talcahuana, Chile, South America, nearly ten years ago, and no metallic circuit exchange could have worked better. The longest line, however, was not over two and one-half miles, hence the reason for the good service.

This system may be either central energy, magneto, or a combination of both. All wires should be of copper and the line re-

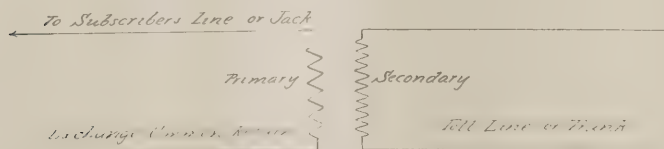


FIG. 2.—Repeating coil as used to overcome noise, when connecting a common return line to a long metallic circuit.

sistance kept down to the lowest point, thereby securing the best balanced conditions. The resistance of the return should also be kept down so as to avoid leakage between lines. Where this system is in use or where a central energy system grounded through a battery is used and connection has to be made with toll or long trunk lines, it should be done by means of repeating coils, as shown in Fig. 2. Where it is desirable to ground the system at the central office, a good ground should be had. Selecting moist earth, dig a deep hole and bury a large copper plate (an old copper kettle or boiler is very suitable), soldered and riveted to a heavy copper wire and the joint protected.

Never solder iron wire to the plate or boiler, as electrolytic action will take place and destroy the connection. In addition to this, it is well to connect another branch of the same ground wire to a good water system, making the connection as near the ground as possible and between the meter and the main. All connections of this kind and all connecting wires should be so arranged as to be easily accessible and all connections and joints thoroughly soldered. A No. 6 copper wire (stranded) makes a good main ground. Branches may be smaller, but not less than No. 12 E. L. S. where more than six lines are used on the same ground.

It is good practice to have a separate return for each lead of wires and confine the ground side of all subscribers' lines on that lead (or route) to their proper return. These branch returns should, if possible, terminate in a switch at the central office (as shown in Fig. 3) and be so arranged as to be able to open the return for a test; ground them all together or bunch them together without a ground, as may be found necessary. A defective splice (or joint) at any point in the common return will produce a cross. If several subscribers become apparently crossed in one district and on the same return, it can reasonably be inferred that the return is open at a point between the central office and the subscriber nearest to the central office, probably due to a break or a bad joint. This can be tested and located by grounding said branch of the return system at one or more places between the two points indicated, until the trouble is removed. It is usual to half the distance and keep on halving the bad portion until found. The trouble could more easily be removed by grounding the return at one of the affected subscribers' stations, and is often done by careless workmen.

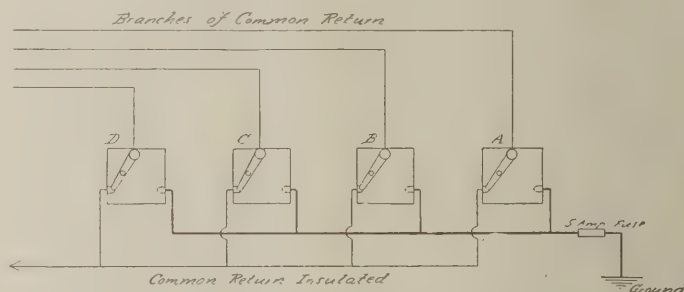


FIG. 3.—1. In center for open test. 2. Left, return insulated. 3. Right, return grounded.

such methods the system is soon converted into a grounded one and the beneficial results of the common return lost, all because of the laziness of an employee. Such carelessness can be located in a system provided with switches (as shown in Fig. 3). A test of all returns made weekly will obviate such wrong conditions becoming general, and careless men will soon find out that such work will not do.

Trouble at the central office (on the return) usually takes on the appearance of cross-talk or an unbalanced condition. A return becoming crossed with a trolley or other high-tension circuit, will generally produce a noisy condition on nearly all the exchange lines, and the trouble can be located by opening each switch (on the return) and observing the result. If very heavy, a spark will be noticed; if only slight, a change will be seen in the disturbance. Having found the apparent location, it is customary to call up the power company and verify the test by having them shut down the circuit in that district for a few seconds. If the test has been correct, the noise will cease, in which case a trouble man from each company is usually sent out to clear the trouble.

The size of wire to be used for common return is of very great importance, and the following rule is generally used in finding this:

$$D = \frac{A + C + B}{E}$$

A=resistance of exchange signal.
B=resistance of line (average).

C=resistance of ringer spools.

D=resistance of copper wire (average length of lines).

E=number of lines to be cared for by said return.

The exchange signal coils now in use are usually high and tubular (500 ohms), and the ringer spools have an equal resistance. This will greatly help to keep the return in a good

condition and make a saving in size of wire. In all return systems, the conditions having been installed and working smoothly, great care should be taken to keep them that way, as trouble, if not taken care of promptly, grows very rapidly and is much harder to locate and remove because of the complications which have accumulated.

CONTEMPORARY CROSS TALK

DISCUSSING thoroughly the pros and cons of both flat and message rates for telephone service we find that each has its difficulties and disadvantages but on the whole the difficulties and disadvantages of the flat rate, it would not even be putting it too strongly to say the positive dangers of the flat rate, are very much greater than those of the message rate. A low flat rate undoubtedly stimulates the use of the telephone, whereas a message rate undoubtedly tends to check the use of the telephone. But in the one case the increasing use of the telephone means a decreasing ratio of profit, eating away at a fixed revenue which cannot be increased, and in the other case the check on the use simply means a temporary hesitation which will disappear as the telephone user becomes accustomed to the message rate and finds the telephone habit growing stronger and taking a firmer hold on him.

* * *

That is the great difference between flat and message rates. The expansion of the business, the growth of the telephone habit, the increase in the number of telephones in use and the increase in the average use of the telephone, all tend to make the flat rate unprofitable; whereas, all these influences help to put the message rate system on a surer and more profitable basis. The reason, of course, is clear to anyone who has followed the arguments made use of in these notes and has satisfied himself of the correctness of the analysis of telephone costs and charges that has been made in them. If the minute-mile unit is accepted as the true unit of telephone service, and it would be difficult to point out any other unit by which to measure what a telephone system furnishes to its customers, then it is clear that the flat rate is fundamentally wrong. And if the flat rate is fundamentally wrong it is equally clear that the message rate is fundamentally right.

* * *

That the flat rate is fundamentally wrong—and if there were any adverb that could qualify wrongness more emphatically than *fundamentally* it would be used, but as *fundamentally* means from the root or foundation upward it is sufficiently expressive and accurate—that the flat rate is fundamentally wrong is clearly to be understood and appreciated by anybody when it is considered that the flat rate makes the line and station the unit of telephone charges, whereas, the unit of *cost* is the minute-mile. Now, as we have seen, and as every telephone man knows, one flat rate station may use a thousand minute-miles a day and another may use only ten, yet both pay alike. Moreover, since every customer pays the same amount yearly whether he uses the service much or little, every customer will use the service as much as he possibly can, so that the average number of minute-miles consumed per customer will go up, up, up, carrying the operating expenses per line ever upward, while the revenue per line remains unhappily fixed at one sum by the unfortunate adoption of the flat rate.

* * *

That the message rate is fundamentally right is obvious when it is considered that it is based as nearly as may be on the true unit of telephone service—the minute-mile. As we saw in our early analysis of the minute-mile, it is practically impossible to make the message charge for local service conform completely and accurately to the minute-mile. It would not be practicable, in conducting the traffic of a local telegraph system, to measure accurately either the number of minutes or the number of miles in every message. Consequently we have to be content with averages and make a charge based on the average number of minute-miles in each message. Fortunately one-half of the unit takes care of itself, for it is well-known that the average time of a local telephone conversation is under two minutes. The rest

of the time occupied by the complete connection or message depends upon the efficiency with which the service is conducted. With rapid operating and the most modern equipment it ought not to exceed—well, let every traffic manager put his own figure on that part of the message. Suffice it to say that, the actual conversation averaging under two minutes, the average time occupied by the complete connection, from call to disconnection, ought to be well under three minutes.

* * *

Consequently we see that the time element of the unit practically takes care of itself, as the time occupied by the average local telephone message can be very closely estimated and will not vary very much among the bulk of the messages carried daily by a large telephone system. That is to say, in every hundred messages there will be comparatively few in which the actual conversation will occupy much over two minutes and comparatively few in which the actual conversation will occupy much under two minutes, these latter, however, predominating, especially in a large and busy centre. This is a fortunate fact, as we shall presently see, and has an important compensating influence toward offsetting the tendency to increase on the part of the other element of the unit, the distance.

* * *

This part of the minute-mile unit, as we stated in the earlier part of this discussion, must inevitably grow. As a local telephone system grows and spreads itself out over the town which it serves, and increases its stations in the outlying parts, it is certain that the distance which the average message has to be carried will increase. This is such a simple proposition that it needs little argument or demonstration. The same process is observable in local railway service. As the street car systems spread out and numerous connecting lines radiate in all directions, transferring passengers from one line to another, the average distance that a passenger is carried steadily increases. The short-distance passenger is still present in great numbers, but, on the other hand, multitudes of people take advantage of the long distances that can be traveled for a single fare, thanks to the radiating lines and the transfer system, and consequently the distance traveled by the average passenger steadily goes up. The average passenger very often has to stand up for the whole or part of his journey, but he does continuously travel further for the same fare.

* * *

Now the telephone subscriber has an inherent right to a transfer to any part of the system. There is no charging him an extra fare for any distance within the same town, which by no means holds true of all street railway systems, and, moreover, he declines to stand up and cling to a strap to be jostled by other passengers. The telephone subscriber demands for his message a line to himself, all the way from his own station to any other station in the system that he may choose to call for. And that other station that he calls for will steadily get further away. As the town grows and the telephone system spreads, the average telephone message will have to travel further, just as surely as with the spread of street railway facilities; the average street railway passenger is carried year by year a greater distance. Therefore the miles in the average local telephone message will be a growing quantity, and the telephone manager will have to furnish his customers with an increasing amount of service in each message, while, like the street railway manager, he is tied by custom to a unit charge for the average message, or carry, which he cannot well increase. Fortunately, however, for the telephone manager, there are compensating influences that will tend to offset this natural and inevitable increase in the service rendered per average messages.

The Listening Key

IN THE OPERATING FIELD

FARM TELEPHONES IN PENNSYLVANIA

FARMERS of Pennsylvania, not to be outdone by their Western brothers, are rapidly acquiring the telephone habit. One of the newest of these lines has recently been constructed in Southern Berks and Northern Chester Counties. It connects the towns of Elverson, Georgetown, Churchtown and Joanna, and gives service to nearly every farm house in the vicinity of these places.

This line was first thought of by Henry M. Hertzler, a farmer living in that neighborhood. He communicated his plan to several of his neighbors, and it was enthusiastically accepted. A meeting was called and a construction committee appointed. The committee laid out the route of the line, and ascertained the approximate cost of construction. A company was then organized with the following officers: Henry M. Hertzler, president; Samuel Deichley, secretary; N. B. Best, treasurer and superintendent; and S. H. Mast, Levi Beiler, Samuel Petershime, Aaron K. Stoltzfoos, Samuel Keller and Levi Keller, directors.

The company built the main line, but each patron furnished the poles for the line leading from the main to his house. Nearly all the farmers cheerfully did this, and had the telephone put in their homes, and since then are all enthusiastic, and say they could not do without the telephone now. There are a few, however, who do not see that it would be to their advantage to install a telephone. A local scribe in corresponding with a daily Pennsylvania newspaper gives the following as some of the reasons for this:

"Some few," says he, "hesitate on the ground that they do not find it necessary to the cultivation of their land. Others hold back because they do not think it belongs to farming, and that they can hitch up and go to the mill or store for what they want. And there are a few of the strict sectarians who are inclined to think that it may be against the teachings of their church to be so worldly."

OUTLOOK IN WASHINGTON, PA.

THE West Penn Telephone Company, operating in the rich field in the southwest of Pittsburg, Pa., will shortly take steps to increase its field and the number of instruments under its control. A meeting of the stockholders has been called to meet at Washington, Pa., October 28 for the purpose of voting on a proposition to issue bonds to the extent of \$25,000 for the purpose of extending the plant in Little Washington.

Washington is a most promising field. It is the center and county seat of Washington county, one of the richest of the western agricultural counties. There are no Independent telephone concerns there, except the West Penn, which has a few pay stations. The West Penn has secured a franchise in Washington, for which it paid \$500 to the borough, and the people are anxiously awaiting its entry.

At present the West Penn Company covers the towns and vicinity of Carnegie, McDonald and other places, and is aiming to get to Wheeling, where it has an agreement to connect with the lines of the National Telephone Company, which has 4,000 instruments in the West Virginia manufacturing city.—*Money*, Pittsburg.

THE TELEPHONE AND THE DRAMA

MR. HALL CAINE, who is at present on his way to this city, is nothing if not modern. But while he is intensely modern, he is also intensely picturesque. His personality is typical of his art. As a man of genius, he must sigh frequently over the difficulty of living up to his own whiskers and majestic dome of thought, just as the man did who found it hard to make his life worthy of his collection of blue china.

In his new play, "The Eternal City," Mr. Caine has put the survivals of the Middle Ages and all the pomp of papal Rome in contrast with the conveniences of modern life. There is one scene in the Vatican gardens, which is an exact copy of a celebrated painting. But this inspiring piece of stage setting, with the hundreds of church bells chiming in the distance, and Mascagni's music as an accompaniment, comes between two scenes in

which certain of his personages rush frantically to the telephone and beg the Roman central in excited tones to hurry up.

The Chief of Police imagines that he is talking by telephone to Prime Minister Bonelli about his plans for capturing Rossi, a radical and revolutionary deputy. As a matter of fact, it is the revolutionists himself who is at the other end. Later on, when the Minister finds himself trapped by Rossi, he rushes to the 'phone to call up police headquarters and summon aid. It is said that these incidents caused a tendency in the audience to smile audibly.

Have our modern playgoers a lack of imagination, or too strong a sense of incongruity? A telephone in the Rome of Puccini and Leoncavallo and Mascagni and Duse and d'Annunzio is not remarkable. It is possible to be a mystic and approve of exposed plumbing. Why should people laugh because Mr. Hall Caine has made a humble but useful device play a part in his ragout of love, jealousy, politics, broken Ten Commandments, and church music? The worthy novelist-dramatist only ventured on one of those corroborative details which give verisimilitude to what would otherwise be a bald and unconvincing narrative.

Besides, what is there undignified about the telephone? Why should it be regarded as only fit for use in a farce? Is it not possible to imagine the Kaiser directing extensive military manoeuvres over the wire, and even swearing at the failure of the opposing force to allow itself to be beaten at the proper moment? Indeed, we in this city have seen a tragedy literally enacted over the telephone, in the case of a little play which has raised our hair and caused our skin to creep in much the same way that it affected the good people of Paris and London.

Mr. Caine, in bringing the drama up to date, should not be discouraged. With the sanity of genius, let him introduce long-distance telegraphy, submarine boats and record-making automobiles into his next drama. With the assistance of these things there ought to be no limit to the flight of his imagination.—*The Sun*.

PRIVATE SWITCH STOPPED HER TALKING

A LINCOLN woman who is an incessant user of the telephone has had more trouble with the instruments than any hundred other patrons put together. Her complaints about poor service poured into the central office in a steady stream. It was thought at first that the girls were quietly breaking her connections to dampen her ardor. This was found to be a mistake, and yet her complaints of bad service continued. Special watch of her telephone showed that it became cut off in the most inexplicable way, and all the ordinary tests failed to locate the trouble. Finally the wire was followed from one end to the other, and the "colored man in the woodpile" was revealed. Some members of her own family had rigged up an impromptu switch in a closet, which had been quietly turned whenever they thought she was devoting too much attention to the telephone.—*Journal*, Lincoln, Neb.

WESTERN PENNSYLVANIA INTERESTS COMBINE

AT a meeting recently held in the office of the P. & A. Telephone Company of those representing telephone interests in Western Pennsylvania, a great many matters of importance were taken up and discussed.

The matter of adopting a uniform design by all companies for pay-station signs was discussed, as well as the more important matters of uniform equipment for special classes of service.

These companies are now interchanging service with most excellent results, and, as a rule, such connections are far superior to lines constructed many years ago by the Bell Company, which have not been brought up to modern standards; but this discussion pertained particularly to special classes of service including methods of handling telegraph business and such telephone service as exclusive use of lines for certain periods during the day.

The meeting was a most successful one, and a big step was taken towards bringing all these interests close together and with a more thorough understanding of each other's methods.

The P. & A. Company has adopted a rebate certificate plan by

which the holder of such certificate is entitled to a rebate on his monthly long distance business, depending upon the amount of his bill at the end of the month, ranging all the way from 10 per cent on \$5 worth to 25 per cent on \$100 worth or over. A number of other companies have adopted the coupon system, the coupon books being sold in advance of use at the same discounts as are given by the rebate certificates. These different systems of handling long distance business between long distance companies connected in this territory caused some little confusion, and this matter was also taken up. After full discussion it was decided that the rebate certificate system was the better of the two. There are very few people who are familiar with the vast territory covered by the Independent telephone interests in this portion of the state and in adjoining states, and there probably are a great many users of telephones who are paying exorbitant rates for long distance messages when they could make a great saving by looking into the facilities offered by the competitors of the Bell Telephone Company. As an example, recently the American Tin Plate Company, a concern that one would think would not look so carefully into the costs of telegraph service as possibly a private firm of brokers, yet on the other hand they have contracted with the Independent company operating in this city for all their telegraph service between this point and their offices and works in Western Pennsylvania and Ohio. This system has now been in service since early in the year, and not only has saved the company several thousands of dollars, but has been most satisfactory in every way. The Steel Car Forge Company, and the Sharon Steel Company are two of the many patrons of the company who give them their long distance business exclusively.

The growth of the Independent company's business has been so rapid that they have actually had to move their long distance headquarters three times in order to provide sufficient room for a long time to come.

With regard to what competition does for a city in the way of telephone business besides keeping rates down to where they should be as pointed out in one of our former issues, the following is interesting:

At the time the Independent company started up in Pittsburg, the Bell Company had a few over 6,900 telephones. The P. & A. now has something over 11,000 in operation connected with its system, and the Bell Company claims an equal number, making a total of 22,000 telephones in operation in Pittsburg and Allegheny and in the boroughs immediately adjacent to Pittsburg. If all of these 22,000 telephones were on the lines of the Bell Telephone Company at the rates they charged prior to the coming of the Independent company, the public of this vicinity would be paying annually for telephone service over \$1,350,000 more than they are at the present time. There can be no question as to the advantages of good, healthy competition.—*Money*, Pittsburg.

WILL COST IT A MILLION

JUDGE TULEY, in a Chicago court, has given the complainants in the suit of the Illinois Manufacturers' Association permission to amend their petition for injunction so as to enable them to secure the return of the funds alleged to have been collected in excess of the franchise rate. The construction placed on his decision by attorneys for the complainants is that 5,000 or 6,000 telephone lessees may come into the suit and become parties to it, whether they are members of the Manufacturers' Association or not.

The decision of the court, it is estimated, will cost the Chicago Telephone Company more than \$1,000,000, unless the Supreme Court reverses the judgment of Judge Tuley. All that remains for the complainants to do now is to prove up their claims.

There were 337 lessees involved in the original suit, their claims being in the aggregate about \$75,000, but all the druggists, liverymen, and private citizens who paid \$175 a year for their telephones may come in and become parties to the suit, Judge Tuley holding that all may be considered together. The question as to whether they can go back of five years, the time provided in the statute of limitation, remains to be argued.

"READY AND ANXIOUS"

NOT so long ago but what it can easily be remembered, the Bell Telephone Company refused with scorn to give the farmers of the country any telephone service or connection whatever. Even the smaller cities and towns were denied service, on the plea that it was not profitable. The Independent companies then sprung into being. Farmers, determined to have ser-

vice, banded together and built lines of their own. The Independents saw that there was profit in connecting farm lines to their exchanges, and they have made a practice of this.

In the past few years, however, the Bell Company has been forced to reverse itself many times. A sample of this appeared recently as an advertisement in the *Courier*, Evansville, Ind. Here the Bell Company states that "it is ready and anxious" to connect any private or farmers' lines to its exchange in Evansville. The advertisement follows, not because of any literary worth it may have, but simply to show how completely the Bell policy has been reversed:

"The Cumberland Telephone and Telegraph Company desires to announce to any and all owners of private telephone systems in towns not now connected with Evansville, that it is ready and anxious to connect with them on any reasonable and fair basis, and it earnestly invites the owners of such lines to communicate with it promptly. Practically all of the towns, villages and post-offices within the trade area of Evansville have been connected with the wholesale interests of Evansville by this company long ago, but if there yet remain towns that want connections, it will be very easy to connect same by communicating with us, and we are specially anxious to give connection at Evansville with any and all private or farmers' lines in Vanderburg County."

LO! THE POOR OPERATOR

AT last the "hello" girl who is prompt to answer the ring and accurate to give the right number has been discovered in Muscatine, Ia.—*Albany Argus*.

Fashionable perhaps, but cheap, pernickety and poor tempered. The genus "hello girl" is a marvel of promptness, clear-headedness and attention. She is an honor to her sex. Put yourself in her place and think it over, if you are disposed to fret yourself in the manner of our contemporary in Albany.—*The Sun*.

STATUS OF WIRELESS TELEPHONY

SINCE wireless telegraphy has achieved a commercial position through the persevering work of Mr. Marconi, the public has been hearing great stories about wireless telephony—how some new discovery was going to displace the present telephone systems, and even revolutionize the daily life of the civilized world.

Prof. Ayrton, the English expert, for instance, recently drew the pathetic picture of the English man of the near future taking his wireless telephone from his pocket, vainly endeavoring to call up his brother in South Africa, and after repeated failures finally coming to the conclusion that his brother was dead. As a matter of fact, beyond a pleasant exercise for the imagination, such dreaming is quite unjustified.

In the first place, as the London *Electrician* points out, the only systems which have up to date proved at all workable over even short distances—that employed by Herr Ruhmer and Sir William Preece's method—are neither of them similar to the only system of wireless telegraphy which has achieved marked success, and, in fact, do not depend on the use of Hertzian waves, so that no favorable predictions can be made for the wireless telephone because of the success of its telegraphic prototype. Ruhmer's system, which has sent verbal messages over a distance of four or five miles, is essentially optical, a powerful beam of light being directed from the sending station to an electro-optically sensitive "eye," or receiver, at the receiving station. This method was first used by Prof. Alexander Graham Bell in the so-called photophone. Sir William Preece's method transmits the message between two aerial parallel wires, one of which acts as a transmitter and the other as a receiver. A battery and a microphone in the circuit of the transmitting wire and a telephone in that of the receiving wire complete the apparatus. The amount of aerial wire used in this system is often much greater than that which would be required to directly connect the two stations.

Nothing in existing lines of research, whether with Hertzian waves or otherwise, gives the slightest warrant for the inference that urban and interurban telephony will ever be carried on without the aid of conducting wires. It is, of course, quite true that we cannot claim to be able to perceive the limits of possible inventions, and a future generation may conceivably accomplish as much in wireless telephony as is dreamed of by to-day's visionaries, but if it does it will be by means of discoveries hitherto not even suspected, and by methods not even the germ of which can be detected in the wireless telegraphy of to-day.—*N. Y. Commercial Advertiser*.

Opinion and Comment

IS TELEPHONE COMPETITION DESIRABLE?

WHETHER the Bell Telephone Company is operating, if there is talk of establishing a rival Independent company, a hue and cry is always raised about the undesirability of telephone competition. There are dozens of arguments advanced against a competing system, and the advertising agents of the Bell Company work overtime, inventing and promulgating excuses, warning the people of the dire calamities that always result from competition. By the advent of competition the people, say the Bell agents, are simply made to pay double for their telephone service, the extra amount going into the pockets of individuals styling themselves "Independents." So cleverly are these arguments constructed and so insidiously are they spread about a town, that they usually carry weight with unthinking people.

But after seven years practical trial, competition in telephony has been found to be a very good thing for a community, despite the plausible arguments advanced by the Bell people. And for very manifest reasons, as any thinking person will agree. Of course, it is admitted that a telephone service operated exclusively by one corporation is the ideal service, provided it is kept up to the highest standard of efficiency, and at a cost proportional to its worth to the individual subscriber. But in practice this ideal has never been attained under the Bell regime. Where it has no competition, the Bell allows its service to fall behind the times, become worn out and antiquated. Its rates are outrageously high, and no thought is given to the convenience of the public which supports it. The rates keep the number of users of the service down to a minimum.

With the advent of an Independent company in a community, the Bell rates are always lowered. Moreover, its service is always improved and its plant re-constructed in the most modern fashion. The modern Independent company, too, puts in the best and newest construction, and fixes a rate that is proportionate to the quality and quantity of service given. It also gets on its subscription list, hundreds and sometimes even thousands of people who were not telephone users before, who were attracted by the low rates and excellent service of the Independent company.

Arguments can be deduced from these results of Independent invasions, that completely take the wind out of the Bell arguments. In the first place, patrons of either company get the very best service. For this they do not pay an exorbitant sum, but one consistent with the worth of the service. The rates are frequently reduced to such an extent that a subscriber can have both services for the same amount he formerly paid for one. Even though he pay more for the two services, it is certainly worth the price. For he always has twice the number of people with whom he can communicate and transact business. The more people with whom he can do business by the telephone, the more valuable the telephone becomes to him. He saves the cost several times over, saves himself and his assistants much worry and work, and his business actually increases.

THE UNMANNERLY TELEPHONE

It has often been noted that sharp, curt language is the rule between the two parties to a telephone conversation. When a business man rings the central office, and hears the oper-

ator inquire "number please?" he invariably jerks out the number he wants in a tone that he only uses when in a towering rage. Even the soft, sweet voice of the female operator soliciting his wants in a voice suggestive of the fact that if there is anything in the world she can do for him, that will she do, seems to have no effect. When he gets the party called, and hears a sharp, I-have-no-time-to-waste "hello!" it does not improve his tone. The conversation that ensues is carried on in voices that almost reach the point of brutality. Not only do they speak roughly, gruffly and unfeelingly to each other, but the language they use would not be thought of for one minute if the interview was a personal one.

The rules of telephone etiquette have been carefully laid down frequently. And yet how often are they followed? Probably not once in a hundred times. Fully ninety-nine men out of a hundred throw etiquette and good breeding to the winds when they grasp a receiver and hold it to their ear, and place their lips to a transmitter.

Naturally the question arises, what does a man gain by his intemperate language and voice? Surely nothing. Exchange managers all over the country can tell that he gains nothing, and on the contrary, usually loses from the operators. It is a well known fact that operators soon come to know the discourteous patrons. And in a hundred little ways, no matter how strict the discipline of an exchange, the operators slight such "cranks" as they call them. For instance, if several calls come at once, and a "crank" happens to be of the number, he is kept waiting, the last to be answered. Or if a line he wants, is "busy," the operator, without endangering her standing in the least, may speak the word "busy" with a spiteful intonation that is particularly exasperating, and nearly causes the patron to say, "Central, I don't believe you."

It can be readily seen, then, that a telephone user gains not a thing by his ill manners from the girl at the exchange. Now what, if anything, does he gain by such methods from a party at the other end of the line? Again nothing. If the party is an employee of the house or firm with whom the "crank" is communicating, he resents the ill-tempered inquiries addressed to him. He grows impertinent even, and often has an opportunity to say or leave unsaid, something that the caller may or may not, as the case may be, wish to know. Two business men, no matter how friendly are their personal relations, are usually less friendly, or their conversation sounds so, when connected by telephone.

A man, therefore, has nothing to gain by the strenuous tones and language he uses in a telephonic conversation, and he has everything to lose. Why then, does he do it? It is improbable that a correct or satisfying answer has ever been found. It may be because he is in a hurry, or because of the strain of carrying on a conversation with a person unseen, or the exertion of using the telephone instrument, or other reasons, or a combination of any or all. However this may be, one thing is certain. And that is that this practice, fortunately for all concerned in a telephone conversation, is becoming less and less frequent. Telephone users are learning that good service and in many instances, actual business advantages, are obtained by affability in the use of the telephone. And they are profiting by their learning.

JOINT INDEPENDENT CONVENTION.

AN Independent Convention will be held in Louisville, Ky., October 28 and 29 that will be of the utmost importance to the industry in a section of the country that has seen wonderful development. In that city on those dates the Kentucky Telephone Association and the Southern Indiana Telephone Association will hold a joint meeting. The interests of these two associations are closely allied, both territorially and financially. It has been announced, although not officially, that at this convention steps will be taken for an amalgamation of the two associations. Even if this is not consummated, they will at least form a closer connection on a good working basis, which will be advantageous to all concerned.

This is the fourth annual meeting of the Kentucky Association and the third annual of the Southern Indiana. Although a detailed program has not yet been completed, the work of the convention has been laid out in a general way. Many questions of importance having a direct bearing on the Independent situation in the section represented by these associations will be brought forward and discussed. While in the city the delegates will be entertained by the officials of the Louisville Home Telephone Company, and they are preparing several novel features

for the recreation of their guests while in Louisville.

In the announcement of the event sent out all Independent Telephone Companies are cordially requested to attend. Each company is requested to bring or send a full report of its system, giving the number of exchanges operated, number of telephones, miles of toll lines, and whether grounded or metallic circuits, and between what points run. Pen or pencil sketches showing lines and stations are also requested; also for any new lines under construction or contemplated.

The officers of the Kentucky Association are: R. V. Bishop, president, Cynthiana; H. K. Cole, vice-president, Owensboro; James Maret, secretary and treasurer, Mt. Vernon; D. L. Pendleton, attorney, Winchester. A. H. Bastin, Lancaster; D. Prewitt, Pine Grove; J. A. Armstrong, Louisville, and R. V. Bishop and James Maret compose the executive committee.

G. A. Kienle, Huntingburg, Ind., is president of the Southern Indiana Association; C. D. Knoefel, New Albany, vice-president; E. W. Pickhardt, Huntingburg, secretary, and T. M. Thorn, Lamar, treasurer.

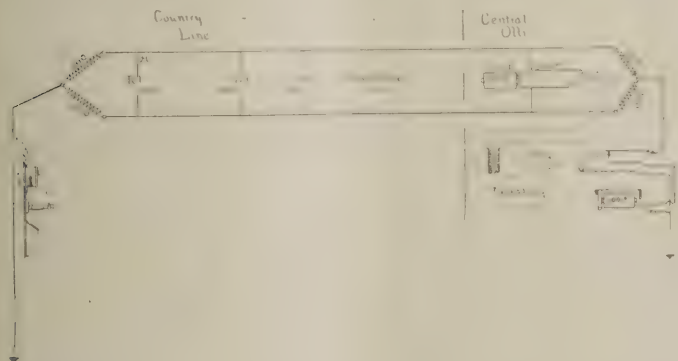
A very large attendance is expected at this meeting, as nearly every Independent Company in that section is a member.

QUERIES

A "Phantom Circuit" Problem.

THERE is a device now on the market that is called a "Duplexer," which is used to make a phantom circuit on a metallic telephone line. I suppose it gets its name from the fact that it doubles the two sides of a metallic circuit as a single line and thus reduces the ohmic resistance of the circuit to one-half of what one wire would measure on an old style grounded circuit, plus the resistance of the instruments.

Now then if the Duplexer parallels the two sides of a metallic circuit as one wire to make the phantom circuit, why not call this "Duplexer" a "Parallizer" and be done with it? I think that not a few of the troubleshooters and inspectors will agree with me on the name. In setting up these phantom circuits with either a ground or a metallic return they ought to be connected through a switch so that the phantom circuit could be easily broken away



to allow the proper tests for locating troubles on the wires; if all is left connected solid the tests might be misleading.

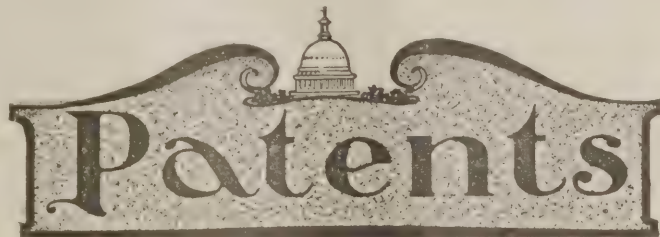
Now for the problem. We wish to get the phantom circuit telephone "S" to talk to the bridging telephone "M," which is in multiple across the parallel lines of the phantom circuit. A look at the diagram will show both the problem and the solution. I had the pleasure of trying this experiment and found that it could be successfully done with the use of a repeating coil at the exchange end, one winding of the repeating coil being in the phantom circuit to ground and the other winding connected to the two wires of the metallic circuit.

C. E. NICHOLAS,

Manager Kenton Telephone Company, Kenton, O.

Our correspondent's explanation of the action of a split coil in a duplexed circuit is hardly the true one as his own solution of his problem might show him. It is not a question of ohmic resistance at all but of splitting the currents from the duplexed

instruments so that they will neutralize each other on the metallic bridges. The idea of turning the currents from the phantom circuit back into the metallic circuit by means of a repeating coil is certainly highly ingenious, and the effect is surely a most curious one in telephonic transmission as the currents from S first pass M along the two wires of the circuit and then come back to M along the same wires, meeting succeeding currents without interference.



Louis J. Loeffler, of New York, N. Y., patents (No. 710,065, September 30, 1902) a self-restoring telephone. The telephone is intended for intercommunicating systems, and is of the push-button type. When the button *b* is pushed in to its full extent the spring *a*, which is the termination of a sectional wire, meets

Fig 1

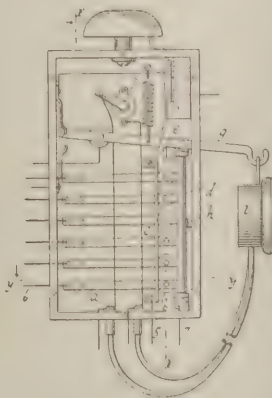
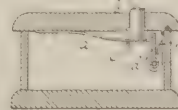
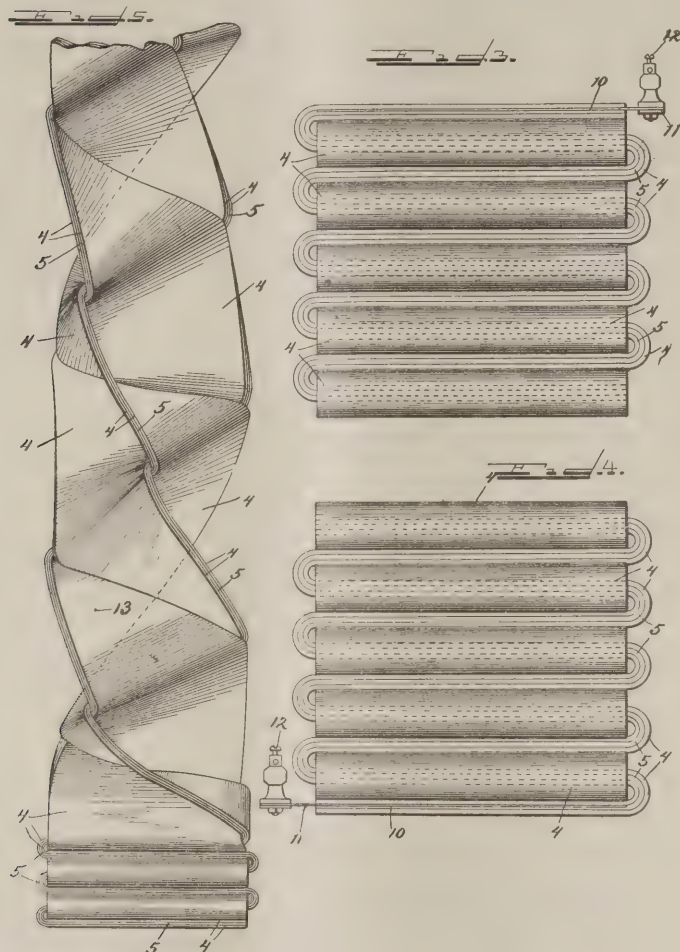


Fig 2



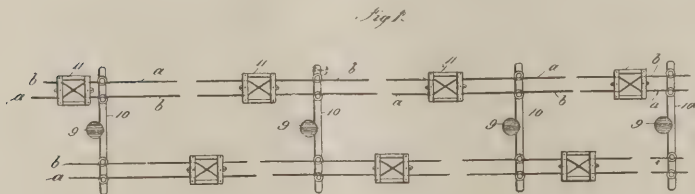
the contact bar *c*, thus making the ringing connection. When released it springs back until caught by the oscillating catch *a* which closes the talking circuit. When the receiver is replaced on the hook the nose *f*, on the lever *g*, engages the arm *e*, thus pushing back the catch *a* and releasing the depressed button.

Henry P. Clausen, of Chicago, Ill., patents (No. 709,205, September 16, 1902) and assigns to the Western Electric Company, an electric condenser and method of making the same. The principal feature of this device is the peculiarity of its construction. The several layers of the condenser, each layer consisting of tinfoil or like material enclosed by a dielectric of paper or similar sub-



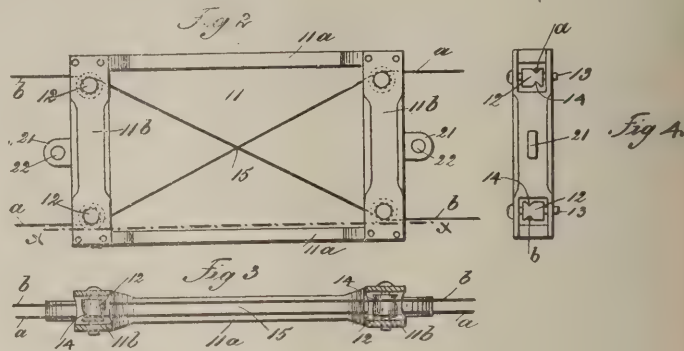
stance, are folded at right angles to each other as shown in the drawing. The strips are made in two sets and to one end of each set can be attached the connection terminals. It is claimed that the layers can be pulled apart like an accordion for inspection or repairs.

J. O'Brien and J. Mattimore, of Staten Island, N. Y., patent (No. 710,206, September 30, 1902) an apparatus for transposing electric circuit wires so as to equalize induction. The object of this invention is to perfectly balance the transposition of telephone or telegraph wires so as to equalize the induction. In ordinary practice these points of transposition are made at poles, which are not always equally distant from one another, hence



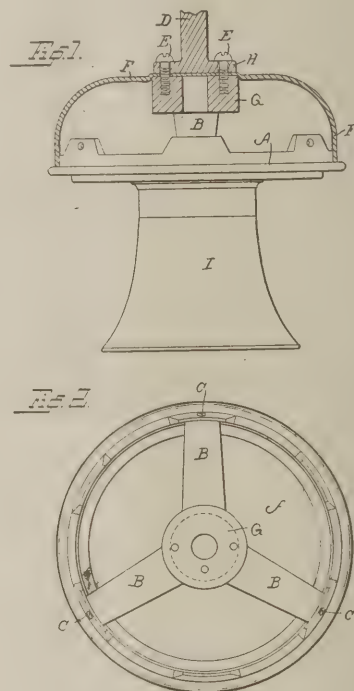
to overcome this objection the inventors have designed a method of effecting a transposition midway between the poles if necessary. Referring to the drawings, Fig. 1 shows a telephone or other circuit, with the method of transposition displayed. Figs. 2, 3 and 4 show the top, side and end views, respectively. This device consists of a frame 11a, 11b, in the four corners of which are insulators 12, either of the knob type, as shown, or of a tube

pattern. The lines a, b, pass around their respective insulators, crossing in the center of the frame, as shown at 15. By means of the eyes 22, ropes may be attached to the frame and the de-



vice moved along between the poles until perfect transposition is obtained.

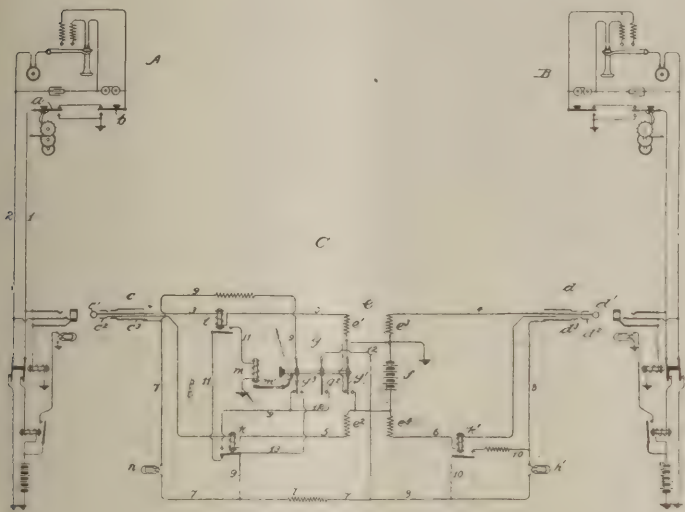
Mathias Weisser, of Milwaukee, Wis., patents (No. 710,309, September 30, 1902) a telephone transmitter. This invention pertains especially to the construction of the frame and shell and the arrangement of parts seen in the drawings, the frame A, holding the diaphragm, is secured by the spider arms B to the hub G, and this is bolted rigidly to the supporting arm D. The shell F, which is of thin sheet metal, is held in place by



being clamped between the hub G and the flanges H of the supporting arm.

William W. Dean, of Chicago, Ill., patents (710,318, September 30, 1902) and assigns to the Western Electric Company toll apparatus for telephone exchanges. The object of this invention is to provide means whereby a charge may be made for each call sent in by a subscriber, wherein the connection with the party called for is actually made. A toll device is necessary at the subscriber's station and a blocking device at the central office. This device blocks or prevents conversation by the calling party until the toll device has been operated, registering the call. This action automatically restores the blocking device to its normal position, allowing the full connection to be made between the two subscribers. The apparatus is especially designed for centralized battery systems, as the blocking switch, which is set manually by the operator, is released by a magnet controlled by a flow of current from the aforementioned battery. As seen in the drawing, a call is sent to the operator in the usual manner by lifting the receiver from the hook. When the operator has made the desired connection the blocking switch is set, which places both sides 3, 5, of the answering plug

circuit in connection with the free pole of the grounded battery *f*, and at the same time locks the mechanism in that position by the detent *m*¹. The calling subscriber can still hear any sounds coming from the called station and from the central office, but cannot converse until the key *a* is depressed, which



releases the locking switch. Should the calling party desire to signal the central office before the called party answers, it may be accomplished by depressing the key *b*.

Frank R. McBerty, of Evanston, Ill., patents (No. 710,333, September 30, 1902) and assigns to the Western Electric Company a selective calling appliance for telephone lines. This invention applies particularly to the selective ringing or operating of a certain sub-station on a party telephone line, and to better determine the character of the current transmitted a signal is displayed. This remains in position until a subsequent call is sent, which consequently shows a different signal. Fig. 1 shows

Fig. 1

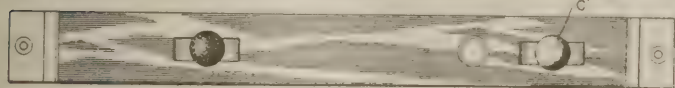


Fig. 2

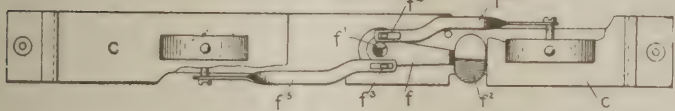
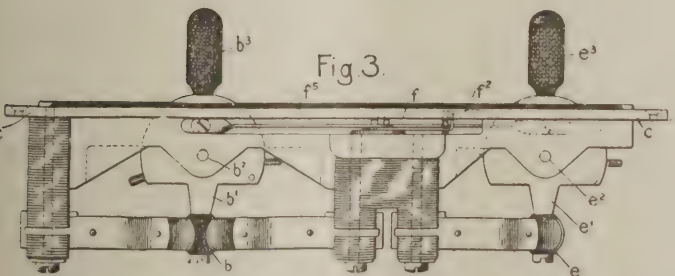


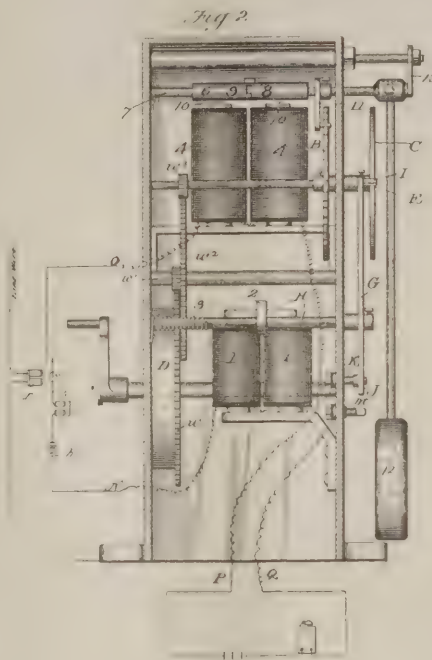
Fig. 3



a surface view of the signal keys, with hole in plate through which the signal is seen. Fig. 2 shows the arrangement of links which operate the signal or target, these links being connected to the target by means of a slot. This slot is of such length as to permit the movement of the signal by each lever separately without disturbing the other. Fig. 3 shows the action of the levers on the links and also on the springs which are used in making the necessary connections for sending the various currents out on the lines. *F*² is the bi-colored target or signal, and it is evident that when the lever *b*⁸ is thrown to the right the black signal will be shown and also when the lever *c*⁸ is thrown

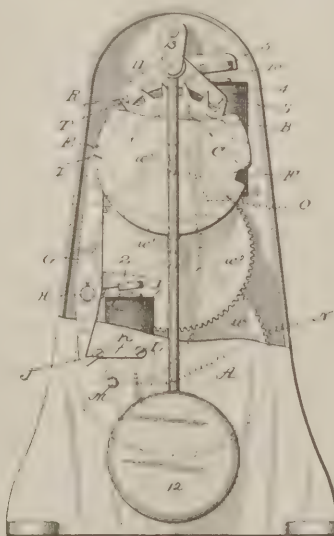
to the right the white signal will be displayed. Thus the identity of the lever last manipulated is always indicated to the operator.

William Palmer, Jr., of Rincon, N. M., patents (710,335, September 30, 1902) and assigns one-half to Charles H. Dascomb, a selective call for telegraph or telephone lines. This apparatus is intended to enable a telegraph or telephone operator to send out signals to any one station on a line without disturbing the remaining stations on the line. The device is of the pendulum type, and is provided with a spring motor for the purpose of rotating the escapement wheel *B* and the disk *C*. When in a



normal position the dog *I* is in the notch *E*. When a call is sent out the current is closed on the line energizing the magnets *4*. This causes the pendulums *12* to swing to the left, and the line is opened. As the pendulums return and pass the center, connection is again made which causes the pendulums to swing again to the left with more force. This operation of opening and closing the circuit is repeated until they reach their

Fig. 2



full swing, which allows the escapement to operate in the toothed wheel. When the wheel has moved the desired number of notches the operator closes the circuit again, which energizes the armatures *2* and pulls all the dogs *I* to the disk. At the proper station the notch *F* will be opposite the dog, and the signal will be rung as the dog drops into the notch by the lever *K* dropping into the contact *M*. Apparently this connection continues till removed by the attendant at the called station.



New Companies

COLORADO SPRINGS, COLO.—The People's Construction Company has been incorporated with a capital stock of \$50,000. The company will construct telephone lines in Teller, El Paso, Douglas, and Arapahoe counties. The incorporators are R. J. Bolles, H. C. Shrimp and Samuel H. Benton.

AUGUSTA, ILL.—The Augusta-Bowen Mutual Telephone Company has been incorporated with a capital stock of \$1,000. Incorporators, George A. Miller, Isaac Winfield and Henry Williard.

CRAWFORDSVILLE, IND.—For several weeks past the co-operative telephone people have been quietly but earnestly working to perfect a corporation to establish a telephone system on the co-operative plan co-extensive with the county. The purpose is to have direct communication from a central office to be located in Crawfordsville with every part of the county, either through connections made with other local companies or by other direct lines, so that every member of the company can from his own residence or place of business talk with a customer or friend in any part of the county, and without expense other than the membership fee. A large number of persons have already taken stock in the enterprise.

PROVIDENCE, IND.—The Providence Telephone Company has been incorporated by William M. Province, P. G. Covert, George L. Jeffry, Thomas J. Vandiver, George C. Banta, Abram S. Deer, Harvey M. Kiphart, Elmer Deer, Frank Rivers, Frank D. Etter, Charles O. Haymaker, Samuel George, John Herring, James V. Deer, William H. Miller, Mollie B. Deming, Chauncey L. Vanmays, Caroline L. Deer, Thomas S. Blackwell, Fred R. Strickler and Oran W. Deer. The capital stock of the company is \$5,000.

BURLINGTON, IA.—The Burlington and Augusta Telephone Company has filed articles of incorporation. The principal place of business will be at the city of Burlington, Iowa. The object is stated as follows: This corporation is formed for the purpose of purchasing, building and operating telephone lines and telephone exchanges in Des Moines county, and in adjoining counties in the State of Iowa, and for that purpose may purchase, lease, acquire, sell, transfer and convey real estate and personal property, rights and franchises necessary or useful in the operation of said business. The authorized capital stock is \$5,000, divided into shares of \$50 each, to be issued as may be ordered by the officers of the corporation or the stockholders. The stock is non-assessable. The corporation will commence business after \$1,000 of the capital stock shall have been subscribed and paid in. The annual meeting is to be held in Burlington on the second Monday of January of each year. The present officers of the corporation are: President, E. W. Romkey; vice-president, Henry Magel; secretary and treasurer, Nils C. Hansen. Directors—E. W. Romkey, Henry Magel and Nils C. Hansen.

ABILENE, KAS.—The Brown Telephone Company, of Abilene, has been incorporated with a capital stock of \$50,000.

SABETHA, KAS.—The Kansas Oklahoma Telephone Company, and Electrical Supply Company, of Sabetha has been incorporated with a capital stock of \$10,000.

BAY CITY, MICH.—The North East Telephone Company has been incorporated with a capital stock of \$200,000. The officers are W. W. Jones, president; J. F. Land, vice-president; George E. Dutton, secretary and treasurer.

HOWARD LAKE, MINN.—The Howard Lake Telephone Company has been incorporated with a capital stock of \$50,000. The incorporators are John A. Peterson, O. J. Olson, John L. Munson, J. W. Custer, and Nels Munson, of Stockholm; A. G. Custer, W. H. Eddy and P. E. Eddy, of Victor; H. A. Workman and G. A. Koenig, of Howard Lake.

HANNIBAL, MO.—The Bluff City Telephone Company, of Hannibal, has been incorporated with a capital stock of \$10,000. Incorporators: E. D. Hawkins, J. G. Stephenson, George W. Luckey, Homer Metzger and Teylor Fuller.

ASHVILLE, N. Y.—A co-operative telephone company has been organized here with F. E. Boyd, president, and Fred Jones, secretary.

CHATHAM, N. Y.—The Chatham Co-operate Telephone Company, of Chatham, Columbia County, has been incorporated with a capital stock of \$1,000, to operate in and through the towns and villages of Columbia county.

ROCHESTER, N. Y.—The Interlake Telephone Company, receiver, has been incorporated to operate in counties in Western New York, with a capital stock of \$100,000. Directors: George S. Fuller, Albrecht Vogt, and Jacob Gerling, of Rochester.

MARSHALLVILLE, O.—The Marshallville Telephone Company has been incorporated with a capital stock of \$1,000. The incorporators are: W. M. Deidler, D. W. Kauffman, C. W. Biddle, H. H. Bachman, and L. Henderson.

OTTAWA, O.—The New Ottawa Telephone Company has been incorporated with a capital stock of \$150,000. Incorporators: C. H. Brown, B. E. Hixon, V. T. Strong and others.

CARVERSVILLE, PA.—This town and Solebury will be connected by a telephone line to be built by local capitalists.

CENTERVILLE, S. D.—The promoters of a new farmer's telephone company met here recently and completed their organization and elected officers. A line will be built from here to Canton.

Legal

NEW CASTLE, PA.—This city won an important legal fight with the Central District and Printing Telegraph Company, of Pittsburg, when Judge Walling, of Erie, handed down a decree recently making permanent the injunction obtained by the municipality to restrain the telephone company from erecting poles within the city limits. Last October the company began extending its lines along North Jefferson street. Council had refused to grant them the right to make the extension, but the company had men at work before the authorities were aware of the matter.

Financial

ELLIOTT, ILL.—A meeting of stockholders of the Dix Telephone Company has been called here for the purpose of increasing the capital stock of the company.

GREENWOOD, IND.—The Greenwood Telephone Company has increased its capital stock from \$6,000 to \$10,000.

SOUTH BEND, IND.—The South Bend Telephone Company has given a mortgage representing \$400,000 in favor of the Citizens' Loan, Trust and Savings Company.

LEXINGTON, KY.—Upon a complaint the State Board of Valuations and Assessment has reduced the taxes of the Fayette Home Telephone Company, of Lexington, on the total capital from \$240,000 to \$144,000, leaving a franchise valuation of \$119,650.

BOSTON, MASS.—The Chicago Telephone Company has issued \$1,000,000 worth of stock.

CUMBERLAND, MD.—The Western Maryland Telephone Company has executed a mortgage for \$75,000 to the Interstate Trust and Guaranty Company, of Cumberland, which will float the bonds.

CINCINNATI, O.—The capital stock of the City and Suburban Telephone Association will be increased to \$173,250.

GREEN SPRING, O.—The Green Spring Telephone Company, operating in Seneca and Sandusky counties, has increased its capital stock to \$20,000, from \$15,000. J. C. Kanney is president of the company.

Rates

FORT COLLINS, COLO.—The telephone company of Fort Collins will make a general change in its business here next month. Eight-party lines will be cut to five, and four-party lines will be given a two-party service without change in price. The rates on single lines will be reduced from \$80 to \$60 per annum, and two-party lines from \$60 to \$48 per year.

UNIONTOWN, PA.—The Bell Telephone Company has increased its rates here to \$45 for business houses and \$33 for residences, more than twice as much as formerly.

Franchises

BAKERSFIELD, CAL.—F. J. Pazak, representing the Northwest Telegraph and Telephone Company, of Seattle, Wash., has filed an application for a franchise to establish a telephone system in this city with the Board of City Trustees. Mr. Pazak represents capitalists who are putting in telephone systems in Seattle, Oakland and Los Angeles, and will put in systems in Hanford, Visalia, Merced, Stockton and other places. In his appli-

THE WEEK'S MESSAGES *Continued*

cation he states that his principals will put their wires underground in the business part of town and will not charge over the following schedule of rates: Business—Main line, \$3.50 per month; two-party line, \$2 per month; four-party lines, \$1.50. Residence—Main lines, \$3 per month; two-party lines, \$2 per month; four-party lines, \$1 per month.

SAN FRANCISCO, CAL.—The Board of Supervisors have received a petition from the California Automatic Telephone Company for a franchise for twenty-five years, to operate Independent telephone, telegraph and burglar alarm systems, with long-distance connections. The petition is signed by William F. Smith, secretary of the company. The company agrees to the following conditions: The system is to be installed inside of one year, and all wires in the business sections to be underground. It is to be a central energy system, the heads of city departments to have free telephones. Business telephones to be installed at the rate of \$5 per month, with unlimited service, and residence telephones at \$2.50 per month. Residence party telephones with two on a line will cost \$1.50 per month. The company will guarantee to pay the city the sum of 5 per cent on the net income of the system. It will also agree to sell to the city at any time during the life of the franchise the whole plant at the net cost of the same.

NEW BRITAIN, CONN.—The Farmington Valley Telephone Company has made application to the subway commissioners for the use of the city ducts. It is understood that the company intends to complete for local business with the Southern New England Telephone Company. At present the company has a line from the edge of New Britain to Winsted. The New Britain end is at Black Rock. The application of the company to use the ducts asked for has been referred by the subway commissioners to the city electrician. The entire matter will have to finally come before the council before the permission to enter the city is granted.

KEWANEE, ILL.—A representative of the American Electric Telephone Company was here recently looking over the field preparatory to asking the city officials for a franchise.

NORTON, MASS.—The Norton Farmers' Telephone Company, composed of residents of Norton, has petitioned the selectmen for a franchise. It is the purpose of the company to provide a telephone service for the farmers of Norton and the adjoining towns.

WESTBROOK, ME.—The Westbrook Telephone Company at the last meeting of the city council sent in a petition asking for a franchise to construct a pole line and to do business in this city. The petition has been given a first and second reading.

YPSILANTI, MICH.—The Mayor of this city has vetoed the telephone franchise, which was recently granted to Shelly Hutchinson. An attempt to carry the resolution over the veto was defeated.

FREMONT, NEB.—The Farmers' Telephone Company, of Dodge County, has asked for a franchise to enter the city with its lines and to maintain an exchange here. It is stated in the petition that it is not the intention of the Farmer's Company to enter into competition with the Fremont Telephone Company, but to run its lines to the switchboard of the Fremont Company, with whom a traffic agreement is being negotiated.

OMAHA, NEB.—Another Independent telephone company has asked for a franchise here. The Interstate Independent Telephone Company, which has had a franchise pending for some time, will submit the proposition to a vote of the people at the November election.

PERTH AMBOY, N. J.—An ordinance granting a franchise to the Hudson & Middlesex Telephone Company here has passed its first reading by the Board of Aldermen. This company is operating systems in Woodbridge and other parts of the State under local names. All wires will be put underground, according to the terms of the ordinance.

BATAVIA, N. Y.—The highway commissioners of Batavia have granted a franchise to the Inter-Ocean Telephone and Telegraph Company, to cross the town highways and erect poles where necessary to run wires. The commissioners of the town of Pembroke also have granted permission similar to that granted by the Batavia commissioners.

PHELPS, N. Y.—The Inter-Ocean Telephone and Telegraph Company has been granted a franchise to construct its line through this village. It is expected that within a short time the Phelps Telephone Company will connect its line with the Inter-Ocean, thus giving local subscribers long-distance service.

Combinations

FLORA, ILL.—T. J. Friend has consolidated the various telephone lines in Clay County under one management. The lines are being improved, and this city will be made the center of the system.

BROWNSTOWN, IND.—Henry Rust and W. Robertson, together with Elmer Brown, have bought the Brownstown Telephone Company. The consideration received was \$4,700. The business will be conducted under the same name, and many improvements to the service will be made.

JEFFERSON CITY, MO.—The Jefferson City Telephone Exchange has been sold to Lester S. Parker, Houck McHenry and A. M. Hough. The ex-

change was owned by the Capitol Telephone Company, of this city, and was considered an excellent plant, being newly installed. The purchasers announce that there will be no change in rates.

ST. JOSEPH, MO.—The Andrew County Mutual Telephone Company and the Citizens' Telephone Company, of this city, have consolidated. No information concerning the plans of the combined companies can be learned at this time, further than that a new line between Savannah and this city will be built. The Andrew County concern has about 2,000 subscribers.

BINGHAMTON, N. Y.—The directors of the Binghamton Telephone Company held a meeting here recently to turn over the stock of the company to the York State Telephone Company, which is making arrangements to absorb all small telephone companies in the State. The York State Company is constructing long-distance lines in this section of New York, and will compete with the Bell.

SODUS, N. Y.—The stockholders of the Sodus Telephone Company will hold a meeting here soon to take steps for the selling out of the plant here. Twice within the past several months the exchange here has been destroyed by lightning, and the stockholders are disgusted with their bad luck. The Rochester Telephone Company has endeavored before to get hold of the system, and it will now be asked to put in another bid, and it is very likely that a combination will be effected.

TOLEDO, O.—The fact that the Central Union Telephone Company has laid off a score of employes within the past two weeks, and is making no effort to compete for business with the new Toledo Home Telephone Company, has given rise to the rumor that the two have effected a combine. The Home company officials deny the rumor. The Home company is rapidly increasing its list of subscribers. Its new directory will contain 4,500 names. By the first of the year over 6,000 telephones will be in use. "The Bell is helpless," a Home company official said recently, "at least for the time being. It can only cut rates to meet our competition, and even with reduced rates cannot operate its exchange as fast as the Home. I have heard they are making no effort to retain patrons and are removing telephones promptly upon receiving notice, but that is not significant of any deal. The Bell has not purchased the Home and the Home has not bought out the Bell."

Elections

SHELBYVILLE, IND.—The managers of the Mutual Telephone companies of this county recently met in this city and completed their organization by electing Mr. Theobald, of Morristown, president; C. E. Pile, of Marietta, vice president; Perry Harris and Charles Drake, of Lewis Creek, second vice presidents; William Ensminger, of Blue Ridge, treasurer; D. B. Wilson, of Shelbyville, secretary. The purpose of this organization is to give better service to the patrons. A fee of 5 cents will hereafter be charged to every one using any telephone belonging to these companies, who are not subscribers. Another meeting to complete the organization will be held in this city soon.

READING, PA.—At a meeting of the directors of the Consolidated Telephone companies of Pennsylvania W. Kerper Stevens, Isaac Hiester and A. J. Brumbach, of Reading, were elected directors.

Underground

CATSKILL, N. Y.—Superintendent W. J. Conlon, of the Home Telephone Company, will begin work soon on the conduits to be constructed in the business section of the city.

Construction

POMONO, CAL.—A map of this city and the surrounding valley, locating the lines and poles of the new Pomona Valley Telephone Union is being prepared, so that bids may be figured for the entire construction of the new telephone plant.

SAN BERNARDINO, CAL.—C. R. Lloyd, of the San Bernardino Electric Light system, to whom the franchise for a telephone system was sold recently, says the new telephone system will be built, and the work will be commenced before the time allowed by the franchise expires. The work will not have to be commenced within four months, but he says \$10,000 will have been expended by that time. In the business part of town the wires will be placed underground. He says the new system will be completed as soon as possible.

CHILLICOTHE, ILL.—The Southern Union Telephone Company has a force of men extending its line in the western part of Washington County. The line is being constructed from Venedy station, and thence to Venedy, Stone Church, Lively Grove and Oakdale. From the latter place it will be extended to Coulterville, in Randolph County. Direct communications will also be made with the Nashville exchange.

INDIANOLA, I. T.—The Indianola Telephone Company is getting ready

THE WEEK'S MESSAGES Continued.

to string wires from Denison to the Kansas line, and west of South McAlester to Oklahoma City.

ANTHON, IOWA.—A telephone exchange is to be built in Anthon.

COUNCIL BLUFFS, IOWA.—The Illinois Central Railroad has nearly completed the telephone system it has been installing for some time. The line between this city and Chicago has been finished, and the line from Memphis to Louisville is now finished to within 150 miles of the latter city.

NEW MARKET, IA.—Work has begun on the new central office for the Rural Telephone Company, and will be completed as soon as possible.

WAMEGO, KAN.—The Wamego Telephone Company will construct a line into the country from this place. It will connect with other lines at Marys and Rossville, and will run to Topeka.

WICHITA, KAN.—Manager Cole stated that work on the Missouri, Kansas and Texas Telephone Company's new exchange building will commence shortly, so as to have it completed before cold weather sets in.

AUBURN, ME.—There is talk of putting in a new line to Auburn by the way of East Turner and East Auburn.

PITTSFIELD, ME.—Mr. Farrin, of Brighton, is here endeavoring to establish a telephone line from his town through Harmony and Mainstream, connecting Hartland with this section of the county. He has already secured a large subscription of money and material towards this improvement, and shortly expects to see his efforts successful.

CONOWINGO, MD.—The Diamond State Telephone Company is arranging to extend its Cecil County system to Conowingo and Oakwood.

EMMITSBURG, MD.—The Maryland Telephone and Telegraph Company will soon have its exchange here completed.

PRESTON, MD.—The Diamond State Telephone Company is building a branch line from Preston to Choptank.

AMHERST, MASS.—A new switchboard will soon be installed in the telephone exchange here in order to take care of the business.

GREENLAND, MICH.—The Ontonagon County Telephone Company is building a new line from Greenland to Ontonagon.

KIBBIE, MICH.—The Kibbie Telephone Company, now operating in all the towns in Van Buren county and some of the towns in Allegan county, now has its line within four miles of Alamo. Work has been begun on the line from Alamo to Kalamazoo.

PLAINWELL, MICH.—Telephone poles have been erected for a telephone line between this village and Moline, and instruments are being installed. A line is also to be run from Moline to North Dorr, New Salem and Burnips Corners.

FARMINGTON, MINN.—A new telephone line is being constructed from here to Lakeville, Christiana, Eidswold, Hazelwood, New Market, Elko, Webster, Turgen, Lonsdale, Wheatland and Montgomery. The North Star Telephone Company is building the line, having its offices here and being backed by local capital.

JACKSON, MINN.—Over one-half of the capital stock of \$20,000 of the new Jackson Telephone Company, recently incorporated, has been subscribed. It is expected that construction work on the system here and the country lines will be begun soon.

CARROLLTON, MO.—The Carroll County Telephone Company, of which S. A. Clark is the president, has its line completed to this city and connected with the Missouri Valley Telephone Company.

ST. LOUIS, MO.—The Kinloch Telephone Company is erecting a line in Mascoutah.

SCHUYLER, NEB.—Work has been commenced on the new telephone line from this city to Octavia, Linwood, Aby, Edholm, Nimbarg and David City for the Nebraska Telephone Company. When the line is completed the same gang will set poles for several lines from this city for a farmers' system in the county.

LEONARDVILLE, N. J.—A telephone line is being constructed from here to Peapack, under the direction of George F. Stiff.

MOUNT HOLLY, N. J.—The Interstate Telephone Company, which is rebuilding its line in Burlington County, is installing a new switchboard here.

COOPERSTOWN, N. Y.—Flycreek is soon to have a new telephone line up the Flycreek Valley, terminating at Cooperstown. Arthur Colman is connected with the enterprise.

CORNING, N. Y.—The Century Telephone Company is in receipt of a carload of cables to be used in improving its service here.

EARLVILLE, N. Y.—Parker Newton, of this place, is constructing a telephone line connecting many towns nearby.

GENEVA, N. Y.—The work of constructing the new Automatic telephone system is progressing, and Manager Bronson stated that they expected everything finished by the first of November. About thirty men are employed, and wires are going up in all directions.

GLOVERSVILLE, N. Y.—The Glen Telephone Company is installing a telephone system here. The switchboard has already been received and about forty subscribers have been secured.

HILLSDALE, N. Y.—A telephone line will be completed to this village soon.

LYNDONVILLE, N. Y.—The Orleans County Rural Telephone Company is making rapid progress in extending its lines in and about Lyndonville. The line is now completed from Lyndonville to Yates, and has been carried north a mile from Kuckville. The company proposes to extend its line several miles along the lake road, leading west from Kuckville, and as soon as possible it is proposed to connect with Waterport and Carlyon. Connection with Medina is also contemplated. The Orleans County Company is capitalized at \$2,500, and the officers are: President, Walter Tuttle, of Lyndonville; vice-president, Kenneth Hedley, of Yates; secretary and treasurer, S. A. Coe, Yates. The board of directors is composed of the officers named and Dr. D. D. Fraser, of Lyndonville, F. B. Conde, of Lyndonville; Carl W. Hedley, of Yates; L. L. Barre, of Yates. The company expects to continue operations in erecting poles throughout the winter.

NEW HAMPTON, N. Y.—The Wawayanda Telephone Company is stringing its wires through New Hampton.

NEW LISBON, N. Y.—At a recent meeting of the directors of the New Lisbon Farm Telephone Company, it was decided to extend the line to Edmeston. It now extends from Mt. Vision to Turtle Lake, beyond Garrettsville. An effort will be made to reach Edmeston before winter.

NORTH CREEK, N. Y.—A telephone line is being built from North Creek to Mill Creek by way of Sodom.

NORTH TONAWANDA, N. Y.—The system of the Home Telephone Company has increased to such an extent that two extra cables are being strung, with a capacity of 100 lines each. As soon as these are in use it will make 600 lines in operation.

PHOENIX, N. Y.—The work of setting the poles for the new telephone to this village has been completed under the supervision of A. A. Dean, of Fulton. The wires are now being strung.

PRATTSBURG, N. Y.—The work of extending the telephone line from Prattsburg to Rushville and Potter Center has been commenced. The line will also be extended to Italy Hollow.

POLAND, N. Y.—Telephone poles have been erected from this village to Trenton. This connects the long-distance telephone via Trenton and Rome. Branches will be made from North Gage and Russia.

SALAMANCA, N. Y.—A telephone line is being constructed from Salamanca to Humphrey.

SODUS, N. Y.—At the meeting of stockholders here no bids were received from outside companies willing to buy the local system. An assessment of \$1 per member was then levied for the improvements necessitated by the burning out of the system during a lightning storm.

TROY, N. Y.—The Rensselaer Telephone and Telegraph Company has completed the placing of poles and guides, and some of the wires are strung from this city north on the east side of the Hudson River to the Mechanicsville bridge. The wires have also been strung from Saratoga to Mechanicsville.

WATERTOWN, N. Y.—The Northwestern Telephone and Telegraph Company is rebuilding its lines between Black River and Watertown and putting in a new lead. This is preparatory to the reconstruction of the entire line between Carthage and Watertown, which will be accomplished during the coming year.

WATTS FLATS, N. Y.—George W. Appleby, owner of several rural telephone lines in this vicinity, is contemplating many extensions to his system. His line now runs from Boomertown to Blockville, to Watts Flats and to Panama. At Nash's Corners, three miles from Panama, Mr. Appleby's line connects with the Sherman company's line. At Jamestown connection is made with the Home Telephone Company's line.

LISBON, N. D.—The Northwestern Telephone Company will construct a line from here to La Moure.

HAMILTON, O.—The new Hamilton Home Telephone Company is spending \$150,000 on its construction work here.

NORWALK, O.—The Local Telephone Company of Norwalk has ordered material for a new line to be constructed from Monroeville to Morehead. The company will also extend its present line north. The construction will begin as soon as the material arrives.

THE WEEK'S MESSAGES *Concluded*

ZANESVILLE, O.—At a recent meeting of the Zanesville Telephone Company arrangements were made for substantial enlargement of the system. About \$50,000 will be expended for that purpose, giving an increased capacity of about 1,000 lines.

ALBION, PA.—The Albion Telephone Company held a meeting recently and made arrangements to erect a new building.

DOYLESTOWN, PA.—The Keystone Telephone Company, operating an exchange at Hatboro, has secured rights of way over the turnpike between Hatboro and Willow Grove, and will run a cable in a few days. A cable will be strung from Philadelphia to Willow Grove over the poles of the Rapid Transit Company. At Hatboro connection is to be made with the Interstate lines, and over them with the lines of the Standard Company, the Independent company operating in Bucks County.

EDINBORO, PA.—The Mutual Telephone Company has its poles almost set and will string wire at once on a line from Cambridge Springs to Edinboro, via Drake's Mills.

FARMERS, PA.—A telephone line is being built from Farmers to Abbottstown, giving direct connection with York.

GLENOLDEN, PA.—The Keystone Telephone Company is constructing its lines in the borough.

GREENTOWN, PA.—F. G. Hames is putting in new poles and cross-arms on the telephone line from Greentown to South Sterling.

HANOVER, PA.—T. H. Nevitt, of Philadelphia, construction foreman of the United Telephone and Telegraph companies, is here looking over the lines, so as to send in requisitions for supplies for their complete reconstruction.

LITTLESTOWN, PA.—Manager H. W. Hart announces that the telephone lines throughout Adams County will soon be greatly improved, plans having already been made for the proposed changes. The wires in Gettysburg will be cabled and new switchboards are to take the place of the old ones in the various stations throughout the county.

MAUCH CHUNK, PA.—The Pennsylvania Telephone Company is rebuilding its line through Lehighton, erecting new poles and stringing additional wires.

OAK LANE, PA.—The Bell Telephone Company is building a telephone exchange at Oak Lane, which is to cost \$10,000 or \$12,000.

QUAKERTOWN, PA.—A telephone line will be built along the Quakertown & Eastern Railroad in the upper end of Bucks County.

TITUSVILLE, PA.—The Union Telephone Company has its line completed from here to Harmony Township, and will soon have it completed to Tionesta. It will give free service to Oil City, Tionesta and Franklin to all subscribers.

WEST CHESTER, PA.—The United Telephone Company has re-leased its present central office. It is possible that the company will enlarge its system here, although nothing official has yet been stated.

WILLIAMSPORT, PA.—The Pennsylvania Telephone Company is constructing several pairs of metallic wires to reach Trout Run, Bodines, Roaring Branch, Grays, Ralston and Hepburnville. The new lines will be used as toll lines, and will be 44 miles long.

YORK, PA.—A telephone line is being built from Farmers to Abbottstown, to give that place direct connection with York.

ARLINGTON, S. D.—Steps have been taken to secure the construction of a rural telephone line between Arlington and Sinai.

WAGNER, S. D.—A telephone line is being constructed from Wagner to Greenwood.

WATERTOWN, S. DAK.—The telephone company will construct a new copper metallic line from Watertown to Redfield, a distance of seventy-one miles, and expects to begin work on it in a few days.

CLARKSVILLE, TENN.—The new Home Telephone Company is erecting poles for its system here. Work on the exchange building will be begun in the near future.

FT. WORTH, TEXAS.—The new Independent Telephone Company which was recently granted a franchise to construct and operate a system here is now looking for a site on which to build a central office. Solicitors in the field for the new company are meeting with much success, turning in on an average of 100 subscribers daily.

MARFA, TEX.—A new telephone line from Marfa to Shafter and Terlingua is being constructed.

ST. JOHNSBURY, VT.—The line of the Citizens Telephone Company of this place to Concord is nearly completed. As soon as he is finished there, Manager Buzzell will construct a line from McIndoe Falls to Wells River.

MONTEREY, VA.—The Monterey and Staunton Telephone Company is having some substantial improvements made to its lines in all directions. The wires, where fastened to trees, have been removed and large, new

poles substituted for these and for the small poles at first planted. The work is in charge of Richard and Robert Hicklin, of eastern Highland, under the direction of the manager, E. H. McClintie, of Monterey.

STANARDSVILLE, VA.—The Green County Telephone Company has put up poles for a line from Stanardsville to within a few miles of Barboersville.

BUCKHANNON, W. VA.—The West Virginia Eastern Telephone Company will extend the system from Century to Buckhannon. A line will also be built from Elkins to Parsors.

ASHLAND, WIS.—The Home Telephone Company is making rapid progress with its construction work, and the line will be in operation in a short time. The officers of the Standard Construction Company of Defiance, O., which is putting in the system here, held a consultation with the officers of the Zenith Telephone Company of Duluth relative to the purchase of an Independent line between that city and St. Paul. The result of the interview was most favorable, and the Ashland system will have a long distance wire to Duluth, Superior and the Twin Cities.

EDGERTON, WIS.—The Edgerton Telephone Company is building a new line to Indian Fork.

Miscellaneous

ALHAMBRA, CAL.—The Alhambra Telephone Exchange is growing rapidly. The new switchboard is in place, and new cable attached. The line, which serves as a feeder for many lateral lines, has been extended to Garvalia, four miles south, and connections are being made daily.

TULARE, CAL.—The Rural Telephone Company, operating in Tulare, is a success. Extensions of the plant will cover the entire county. S. E. Sibley, general manager, reports that 105 telephones have been installed around Tulare.

CHALLIS, IDAHO.—The telephone line extension from Mackay is completed to within 20 miles of Challis.

COFFEEN, ILL.—The People's Mutual Telephone Company now has its line in operation between Hillsboro and Irving. Over 300 contracts have already been written, and it is expected that nearly every town in the county will be reached by the new line by April 1. The solicitors are meeting with flattering success both in towns and in the country, and it is expected that at least 1,000 instruments will be connected with this new line.

ELWOOD, IND.—The new exchange of the Delaware and Madison Counties Telephone Company in this city has been put in operation, with a total of about 250 instruments connected. The toll line connecting this city with Alexandria and Anderson has also been opened, and the Muncie line will be opened as soon as the exchange there is completed. A. W. Martner is the local manager.

GREENSFORK, IND.—The telephone line in Webster is now complete. There are about 150 patrons of the Greensfork company.

INDIANAPOLIS, IND.—A new branch exchange of the New Telephone Company has been opened. About 1,200 subscribers are connected and there is an ultimate capacity for 3,000.

WABASH, IND.—A disastrous fire burned out the entire telephone system here. It is possible that no telephones can be used for six weeks. The fire was caused by an electric light wire getting crossed with a telephone line. The loss is \$2,000.

CONE, IA.—The plant of the Conesville Telephone Company has been completed. Toll line connections between Cone and Muscatine are open, and at the latter place connections had with the Mississippi Valley Telephone Company.

NEW LONDON, IA.—The Mt. Pleasant Telephone Company and the Henry County Company have connected their lines. The next move, and it is already on foot, is to connect Independent lines across the State.

ST. PAUL, MINN.—The Twin Cities Telephone Company has cut over its lines from the old switchboard to the new one, which was installed at a cost of \$70,000.

ASHLAND, NEB.—The Ashland Home Telephone Company has just finished constructing its system here. The plant cost about \$8,500. The switchboard has a capacity of 200 lines. It has 130 city subscribers connected, and 85 country subscribers.

DEWITT, NEB.—The Dewitt Telephone Company has about 40 city subscribers now on its list and 85 farmers. The demand is very heavy, as the company gives a good service at reasonable rates.

MEREDITH, N. H.—The Meredith telephone system has been extended to Meredith Neck.

CAMDEN, N. J.—The Eastern Telephone and Telegraph Company has extended its lines to Haddon Heights, Mount Ephraim, Collingswood, Orston, Audubon, Oaklyn and Woodbury.

ORANGE, N. J.—The meeting of directors of the Federal Telephone Company has been postponed a month, owing to the inability to transact certain business.

THE WEEKS MESSAGES Concluded

WRIGHTSTOWN, N. J.—The Farmers' Telephone line has established a central office here.

CANANDAIGUA, N. Y.—H. W. Blake, president; George R. Granby, treasurer, and George B. Hemingway, secretary of the People's Telephone Company, were here recently to confer with the promoters of the Inter-Ocean Telephone Company in the furtherance of interests of subscribers in obtaining more thorough service by further connections between the two companies.

COOPERSTOWN, N. Y.—The Cooperstown Telephone Company now has connections by its own wires to Oneonta and all intermediate villages in the Susquehanna Valley. The completion of the line between Cooperstown and Oneonta also gives Cooperstown connections by telephone with Morris, Gilbertsville, Garrettsville and the other towns in the southern end of the county, as well as communication with Cobleskill and intermediate points long the line of the D. & H.

CHURCHVILLE, N. Y.—The Bell Telephone Company wants to erect a local exchange for the village. The company made a proposition to local parties which is now under discussion. It is thought, however, that if a local system is installed it will be entirely Independent of the Bell Company with whose service so much trouble has been found.

NEW BERLIN, N. Y.—The line of the New Berlin Telephone Company is now in operation as far as Chenango Lake, and will be completed to Norwich soon.

ROME, N. Y.—The telephone line from North Rome to Towner is nearly completed.

RUSHVILLE, N. Y.—The People's telephone line, constructed by G. T. Connim from Prattsburg, has reached this place, connecting with Potter Center and points south. This line is used by many farmers and will be a great convenience as soon as fully at work.

SCHENECTADY, N. Y.—J. H. Griswald, vice-president of the American Construction and Trading Company, which is installing the new telephone system in this city for the New Home Telephone Company, stated that the company will be operating its lines in this city before Nov. 1.

KINSTON, N. C.—J. T. Cockrell, manager of the Carolina Telephone Company at Kinston, has delivered the official directory of the Henderson Telephone Company, Carolina Telephone and Telegraph Company, Carolina and Virginia Telephone Company and the Interstate Telephone and Telegraph Company. Most every town or city of any importance in the eastern and central parts of the State can be reached by telephone from Kinston.

BLANCHESTER, O.—The rapid increase in the business of the Clinton Telephone Company, at this place, has made it necessary to procure an additional switchboard.

PLATTSBURG, O.—The Home Telephone Company has just secured a shipment of new telephones from Chicago which will be put in use on several of its new lines.

WINCHESTER, VA.—The Shenandoah County Telephone Company has completed its line to Strasburg, giving connection between this place and Staunton.

MILWAUKEE, WIS.—The Minnesota Mutual Telephone & Telegraph Company has applied for a license to do business in this State. The company has \$20,000 of its capital stock of \$300,000 invested in property in Wisconsin. Charles Avery is vice-president and general manager of the company.

Personal

CADILLAC, MICH.—Walter E. Curry, of New York, is here superintending the construction of a telephone line between Kalamazoo and Detroit.

ST. PAUL, MINN.—C. B. Spring has been appointed traffic manager of the Twin Cities Telephone Company. Mr. Spring was formerly toll line manager of the Northwestern Telephone Company.

TOBIAS, NEB.—The Home Telephone Company is changing its system from magneto call to common battery call.

TRADE NOTES

Mr. E. W. BARNES, of the AMERICAN ELECTRIC TELEPHONE COMPANY, Chicago, has taken charge of the district comprising Western Iowa, Nebraska, and the Dakotas. Mr. Barnes is making the Paxton Hotel in Omaha, Neb., his headquarters.

PLANTS FOR SALE

FOR SALE.—Telephone exchange; 50 telephones, 30 miles toll line. Terms easy. Address F. H. DAVIS, La Crosse, Kan.

FOR SALE—One of best equipped telephone exchanges in Kansas; price, \$22,000; upon which amount plant now NETS 23 per cent. If you mean business, address X for particulars, care of AMERICAN TELEPHONE JOURNAL, New York.

TELEPHONE PLANT FOR SALE—160 telephones, 100 miles of toll lines; excellent opportunity for extending business; will sell for \$12,000; pays 15 per cent. net on this amount. Address TELEPHONE CO., care of AMERICAN TELEPHONE JOURNAL.

WANTED

POSITION as assistant manager of exchange of 100 or 200 subscribers, or as inspector. Best of references furnished. Address T. C. B., care AMERICAN TELEPHONE JOURNAL.

POSITION as superintendent or manager in telephone system, either on line or in exchange, by a young man of strictly temperate habits. Best of references as to character and ability. BOX 145, care AMERICAN TELEPHONE JOURNAL.

POSITION as wire chief in central energy exchange of from one to two thousand subscribers; 9 years' experience; best of references. A. B., care AMERICAN TELEPHONE JOURNAL, New York.

A HOME IN SOUTHERN CALIFORNIA—I desire to communicate with a man capable of taking charge of a factory for insulating rubber-covered National Code wires. This is a splendid opportunity for the right man. References given and required. No money necessary. Address P. O. BOX 1116, Los Angeles, Cal.

POSITIONS as linemen by two experienced workmen. Would prefer construction work in Michigan or nearby State. Address R. M. M., care AMERICAN TELEPHONE JOURNAL, New York.

POSITION as foreman or superintendent with telephone or construction company. Twelve years' experience in telephone construction work; best references furnished. Address J. W. S., care AMERICAN TELEPHONE JOURNAL, N. Y.

POSITION in an exchange of 100 to 500 subscribers, as manager or assistant manager. Experienced in construction and switchboard work; references furnished. Address EVAN PAUL JONES, North Vernon, Ind.

EXCLUSIVE handling of an account, for Chicago trade, beginning January 1st. Manufacturers Agency basis. Address SALESMAN, care AMERICAN TELEPHONE JOURNAL, Monadnock Building, Chicago.

STEADY position as troubleman. Thoroughly understand switchboard, line and instrument work; five years' experience. Address C. R. SAVAGE, Lebanon, O.

EXPERIENCED telephone traveling salesman; acquaintance with Northwest trade preferred, but not essential. Address THE VOUGHT-BERGER COMPANY, makers of telephones and switchboards, La Crosse, Wisconsin.

POSITION by a competent and experienced salesman of electric light, telephone and street railway material, by a young man with 14 years' experience in this business; best of references. Address L. C., care AMERICAN TELEPHONE JOURNAL.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISSELL CO., Toledo, Ohio.

POSITION as manager or superintendent of small exchange; at present in charge of small exchange; 31 years old; married; strictly temperate; references furnished. Address A. B. C., care AMERICAN TELEPHONE JOURNAL.

The American Telephone Journal

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WOOD COUNTY TELEPHONE COMPANY OF GRAND RAPIDS, WISCONSIN

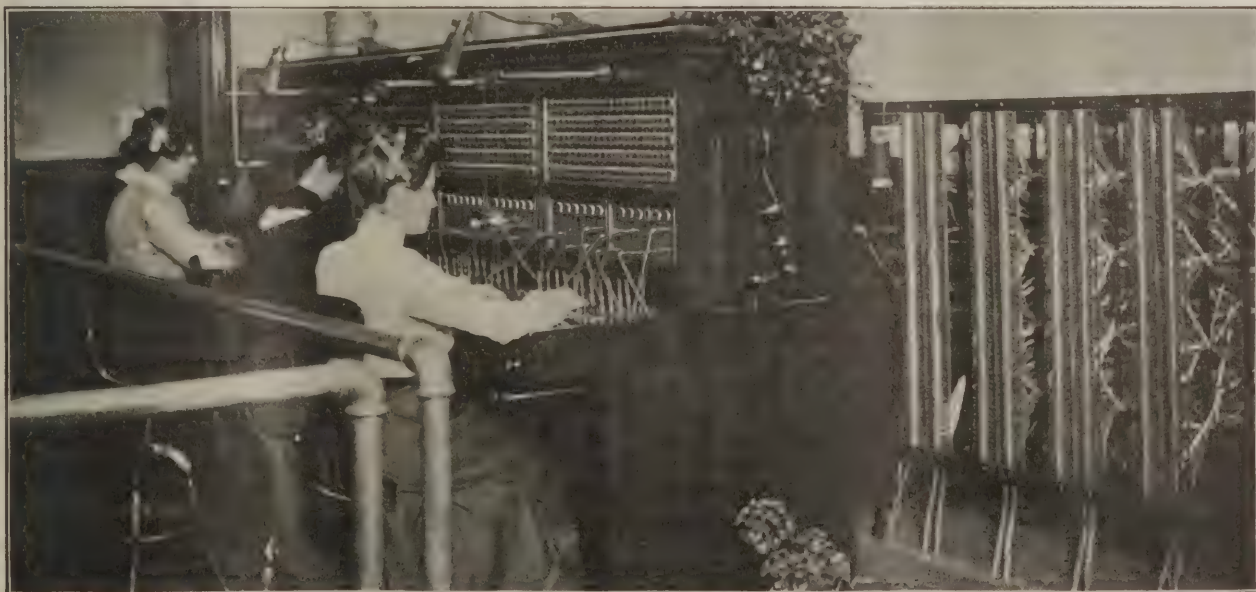
By E. C. STARKS

ONE of the most successful of the mutual telephone companies that are in operation in various parts of the country is the Wood County Telephone Company. The principal office and exchange of this company is in Grand Rapids, Wis., and here from a very small beginning, a system has been gradually built up that serves more than 400 of the 5,500 inhabitants of the town. The company is also getting new subscribers at the rate of sixty-five or seventy a year, and is in a very prosperous condition.

This company was not organized as a money-making institution. Its promoters simply wanted a good telephone service for themselves, and also for their town, and they fixed the rate so that the service is given very nearly at the cost price. Like so many of the other Independent companies, this one had its origin in the refusal of the Bell Company to improve its service, and its extortionate rates. In the spring of 1896, when the company

agreed to become subscribers to the new and a majority to throw out the Bell telephones, a subscription to stock was circulated among them. As soon as one-third had subscribed to stock, a meeting of stockholders was called, and an organization effected by electing a board of directors. The rates as decided on were to be \$27.00 for business houses and \$12.00 for residences. Each subscriber is entitled to purchase one share of stock at \$50 for each telephone he rents. The company pays a monthly dividend of 1 per cent. on each share, which applies on the rental of the instrument.

When sixty shares of stock had been sold at \$50.00 each, the company proceeded to build a plant. Unfortunately it did not employ the best construction or materials, but when it started on July 1, 1897, with ninety subscribers, it gave service equal to, if not more effective than, the Bell Company's service. Before the close of that year the number of subscribers had increased to



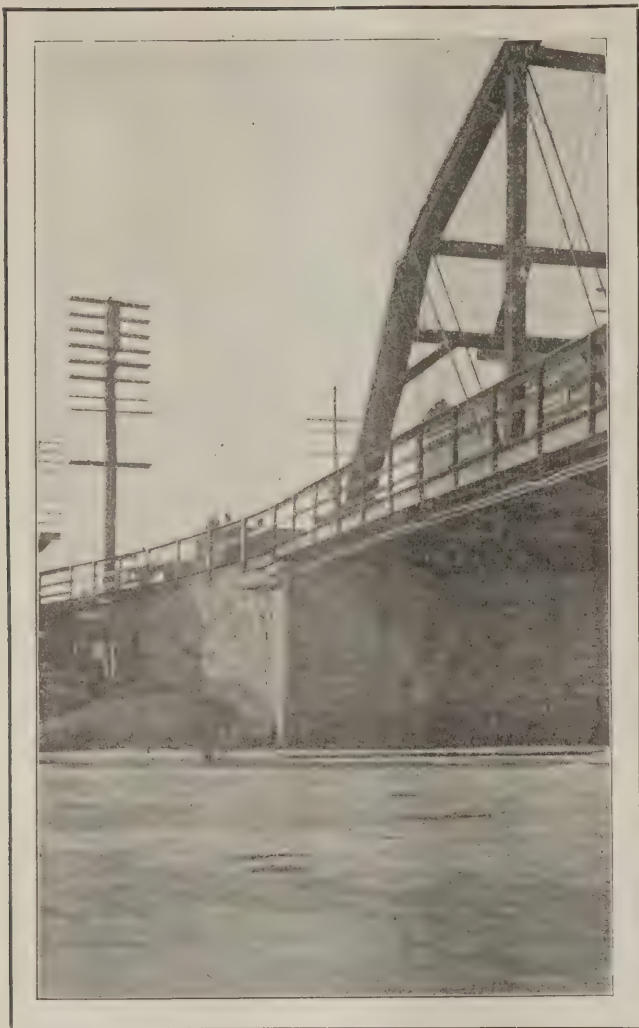
OPERATING ROOM AT GRAND RAPIDS.

was first organized, the Bell operated seventy telephones in Grand Rapids, for which its charges were \$48 for business telephones and \$36 for residences. For this large price it furnished a service of the poorest character, and refused all redress to its patrons. Its answer to all petitions, rebukes or threats was: "You may be able to cut lumber, but you can't operate a telephone exchange." From this answer it evidently thought that it had a safe monopoly in Grand Rapids. But events have shown that it was wrong.

The Hon. John A. Gaynor was one of those who protested most vigorously against the Bell service and rates, and when it was finally realized that nothing could be gained from the Bell, under his leadership the new company was organized. His plan was as follows: First, he and those associated with him, incorporated on the mutual plan. A franchise was secured from the City Council, and a canvas made for new subscribers, many of whom were persuaded also to give up the Bell telephone. When two-thirds of the subscribers of the old company had

120. When the Bell Company saw what progress had been made, it sent out a corps of solicitors offering free service. But when the people realized the object of the old company, the free telephones were promptly discarded, and the Bell kept losing its patronage, until now it only has seven telephones in the city, these being used exclusively for long distance work. But before this result was reached the Bell approached the Mutual people with a proposition for connection. It offered to give them Bell instruments free of rental for ten years, and new subscriber's instruments to rent for \$1.25 per year, provided the Mutual company would turn over all its instruments to the Bell. The stockholders of the Mutual Company unanimously refused these terms, and steadfastly adhered to their independence.

As the exchange grew, the management found it possible to declare a dividend of 1½ per cent. a month, which it continued to do until November, 1901, when the dividend was again reduced to 1 per cent.



CABLE CONSTRUCTION ACROSS BRIDGE.

Each year the growth exceeded 30 per cent., and in November, 1901, the line construction and central office equipment was full, and provision for new subscribers was necessary. It was then decided to rebuild the entire exchange. Over 6,000 feet of 50 pair and 100 pair lead-covered cable was installed, and the central office equipment entirely renewed. A four-section trunking switchboard was installed by the Stromberg-Carlson Telephone Manufacturing Company of the magneto call, manual restoring drop type. This was equipped for 360 lines, with a good margin for future development. New 26-foot to 45-foot poles were erected, and set 40 to the mile. All circuits were made metallic,



DISTRIBUTING POLE.

of No. 12 wire. The approximate cost of construction per mile was \$50.00, including instruments.

The company was originally capitalized at \$5,000 it now has a capitalization of \$18,000, and the plant is worth much more, being in very good condition. The company gave several other Independent companies terminal connections on its exchange, and thus secured connection with neighboring towns, which greatly added to the value of the service. It now has toll connection with between 40 and 50 towns in Wisconsin and neighboring States.

CONTEMPORARY CROSS-TALK.

WE have previously discussed some of the compensating influences that will help to offset the increase in the number of minute-miles in the average local telephone message. The sure and steady increase will come about in the miles; the minutes—the time occupied by the average message—as far as we have examined that point, we have considered to be about stationary, and not much subject to change. The principal compensating influences that we have so far surveyed, in searching for a balance to the increasing range of the local telephone message, have been the economies effected in underground line construction by the use of larger cables, less costly conduit work and other improvements tending to lower the cost of the average mile of local telephone circuit. Great advances have been made in recent years in this direction, and the cost of local line construction and maintenance has been reduced in greater proportion than the amount of line required to carry the average local message has increased. There will no doubt still be progress along the same lines and we shall see still cheaper and larger cables and a lower cost for conduits per mile of circuit; but eventually a limit will be reached in that direction, and a figure will be established per mile of circuit that will fluctuate

only slightly with the market price of raw materials.

* * *

But now let us leave aside for a time any consideration of the distance element of the unit and examine carefully the other element—the minutes. We have agreed that the miles in the average local telephone message will increase as time goes on, from causes quite beyond our control, growing with a natural growth that, indeed, we shall do what we can to aid as we direct our efforts to the development and extension of our systems. The time element, the minutes, however, we have to a certain extent under our control, both directly and indirectly. The total time occupied by a telephone message is made up of two parts—the time spent in operating the message, in building up the connection and in taking it down, and the time spent in the actual conversation itself. Over the time spent on operating we apparently have direct and entire control, and nobody who knows anything of telephone service anywhere can question that there is much room for improvement and economy here. Unfortunately, however, we have not entire control over the operating, for the reason that it is partly done by the telephone subscriber himself; for every message one subscriber calls and another subscriber

answers, or should answer, and upon the efficiency with which the two subscribers do their part of the work partly depends the efficiency of the operating as a whole.

* * *

Only partly, however, and less now than formerly. The central energy system has largely deprived the inexpert and thoughtless subscriber of his power to hinder the general efficiency of the service by his own misuse of the apparatus. With the magneto system the possible sins of commission and omission on the part of the user of the service were many, but with a complete central energy system the worst he can do is to be consistently slow in answering calls. He *must* give a clear and distinct call by the simple, natural and necessary operation of removing the telephone receiver from the hook, and having no generator to twirl he cannot twirl it ferociously, as he formerly did, while the operator is trying to answer him after a few moments delay during a busy period; he *must* give a clear and distinct disconnection signal when he hangs up his telephone receiver, and cannot forget to "ring off" because there is no ringing off to do. The telephone having been in use for about twenty-five years, the intelligence of the general public has finally become equal to grasping the fact that the telephone receiver is intended to be replaced on the hook after a conversation is finished, so that complete failure to give the disconnection signal is now comparatively rare. With the magneto system it was very common and added much to the delays and difficulties of operating.

* * *

The simplicity of working of the central energy system from the subscriber's end of the line, then, practically limits the subscriber's power to aid or hinder the operating efficiency to the single point of answering the call. This is a very important point, however, as a large proportion of the total time spent in operating a message is occupied in getting the called subscriber to the telephone. If the subscribers are habitually slow in answering the telephone bell, a drag is imposed on the whole service and the general efficiency suffers, not from any fault of the telephone company but wholly from the fault of the subscribers themselves. When a close and searching analysis is made of the time spent in operating a telephone message, and of all the various reactions that depend on efficiency or the reverse, it will be more thoroughly and generally appreciated than it was that the training of the subscriber to be efficient is almost as important a piece of work for a telephone company to undertake as the training of the exchange operators. It is of course a much more difficult and delicate task to educate the subscribers than it is to train the operators, but it should be clearly recognized that the subscribers to a large extent operate the system and that on the efficiency with which they do their share of the work necessarily depends the general efficiency of the service as a whole.

* * *

This subject has been discussed in the columns of THE AMERICAN TELEPHONE JOURNAL on various occasions and it is one to which every telephone man will do well to pay constant and serious attention. Much more might be done than is now done to educate the subscriber in the proper use of the telephone, and to convince him that many of the unpractical habits he now indulges in, eventually react upon himself. Presumably every telephone subscriber desires a thoroughly smart and efficient service, a prompt answer from Central to every call, a quick connection with the right number, followed immediately by the clear and distinct voice on the wire of the party called. That is the ideal telephone connection, and is what every telephone company having a right-minded management tries to provide to its subscribers. But there are still too many telephone subscribers who do not try to provide that kind of telephone connection to each other, who do their part of the work in a slovenly, careless, sometimes even in an obstructive way. As we have said, with the disappearance of the magneto system and the general adoption of central energy signaling, the call and disconnection signals are practically automatic and the possibility of bad operating on the part of the subscriber is mainly though not quite entirely confined to the one step of answering the call.

* * *

This is as far as the actual operating is concerned, for when it comes to the part of the time occupied by the conversation itself, the inexpert or inconsiderate subscriber is capable here too of various bad practices that tend to use up the time in a

wasteful and unnecessary manner. At present, however, let us confine our examination of the time element in the minute-mile unit, or rather in the average message, to the part occupied by the operating, leaving the part occupied by the actual conversation for future examination and analysis. The complete connection may be divided into several distinct steps, each requiring certain pieces of work on the part of subscriber and operator. For example, taking a local call on the central energy system:

- (a) Subscriber lifts receiver from hook and line signal glows simultaneously.
- (b) Operator plugs into answering-jack turns listening-key and answers.
- (c) Subscriber gives number wanted.
- (d) Operator repeats back the number.
- (e) Operator tests line wanted.
- (f) Operator says "busy," or
- (f') Plugs in with connecting cord and turns ringing key.
- (g) Called subscriber answers; operator ceases to ring.
- (h) Subscribers, having finished their conversation, hang up their receivers and supervisory lamps glow simultaneously.
- (i) Operator disconnects the two plugs, leaving both lines free to make or receive further calls.

* * *

In the above table it will be seen that the time from *a* to *b* is exclusively the affair of the operator; from *b* to *d* progress depends partly on the subscriber and partly on the operator, as the subscriber may not give the number clearly or correctly, the operator may not check back clearly or correctly and may not give the subscriber a chance to acknowledge or correct the check; and other errors to which human nature is liable may occur; from *d* to *f* the work is again exclusively the operator's, though at the first *f* the subscriber may use up the operator's time by protesting against the "busy" report. From *f* to *g* is the long step that depends entirely on the subscriber and from *h* to *i* is the short final step that belongs again exclusively to the operator. From this short analysis of the progress of a telephone connection it will be seen that the work of both the subscriber and the operator must be efficient to obtain a net efficiency in the total operation.

The Listening Key.

STROMBERG-CARLSON FAREWELL LUNCHEON

ON Saturday evening, October 11, a most enjoyable luncheon and dancing party was given at the Stromberg-Carlson Telephone Manufacturing Company's factory in Chicago. The entertainment was arranged by the employees of the Insulating and Winding Department, and tendered to the employees of other departments. The affair was in the nature of a farewell party, and due to the fact that many of the employees of the Insulation and Winding Department of the Chicago factory go to Rochester, N. Y., where in future the insulated wire and cable product will be manufactured at the company's Rochester plant.

About a year ago a restaurant service was provided for the young women employed by the company, and since that time luncheon has been served daily in this department. It has been more than self-sustaining, and with the surplus in the treasury the young women proposed having the entertainment. Mr. Stromberg was interested in the programme, and very generously defrayed the greater part of the expense in order to make the affair more enjoyable.

The east side seventh floor of the factory was turned into a reception hall. Additional electric lights were placed, tables prepared, and seats arranged for one hundred couples. Short speeches were made by Messrs. Stromberg, Stiger, Nate, Mahon, Runzel and Hedman.

Over 400 were present, of which the following is a partial list: A. L. Stromberg, C. W. Stiger, A. J. Rousseau, J. J. Nate, T. R. Finucane, A. J. Mahon, W. H. Durrant, C. E. Knickerbocker, F. L. Middleton, Carl Schafer, A. A. Anderson, Joe Carlson, W. H. Gray, W. L. Roberts, C. M. Hedman, J. Peterson, Wm. Schuber, Wm. Runzel, E. W. Anderson, A. O. Stigberg, T. C. Troy, Frank Lind, J. N. Woods, W. Ratke, S. E. Wallace, J. S. Troy, C. B. Arbeen, J. P. Lillig, N. Engstrom, A. Peterson, John Meinema, Jas. Krabec, J. Kaiser, A. Hendickson and A. B. Blidd.

CONVENTION OF THE INDIANA MUTUAL ASSOCIATION

IN the parlors of a hotel called the German House, in the city of Indianapolis, on Tuesday, October 14th a body of men who had, seven years ago, banded themselves together into an organization known as the Indiana Mutual Telephone Association, came together to hold their seventh annual session. Most of these men have been in the thick of the battle that has ensued since the Independent fight began. A few of them are comparatively recent additions to the Independent cohorts, but they were equally enthusiastic. They met in Indianapolis for the purpose of exchanging views, giving helpful suggestions and experiences, to look after toll interests and to put themselves in closer touch with their numerous colleagues in Indiana and the other States.

The meeting was called to order by the president of the Association, L. A. Frazee, of Connersville. In explaining to the delegates the objects of the convention, Mr. Frazee said:

Telephone affairs have run so smoothly, the general development has been so great, and most of us have been kept so busy laboring to keep apace with the increasing demands, that we have had little time or occasion to come together during the year of 1902.

In Independent Telephony, we Hoosiers have much cause for state pride. The ups and downs and knocks and fights incidental to entering a new business are with us largely experiences of the almost forgotten past. Struggles and uncertainties we hear of now occurring in many other states, we experienced, it seems years ago. Five years ago, what now constitutes a small part of us, met here and put forth our best efforts to induce some reliable company to install a plant in this, our metropolis, thereby knitting our plants together with toll lines, giving us an entrance into our State capital, patching up the weak spots in our poorly developed field, and developing the unclaimed territory.

Then, perhaps, many of us passed through a period of anxious doubt; doubt possibly of the good faith and sincerity of the new company, or doubt of their ability to meet the Central Union in this, the largest city in their territory. Who of us at that time even hoped for the success that has followed the efforts of this company? And the influence she has given Independent Telephony throughout Central Indiana, and to some extent far beyond the borders of the State, for reliability and strength? Now far be it from me to decry the progress of other States, which States are doing nobly under conditions which are much more unfavorable than with us, for in Illinois, the Bell Company has her Chicago field; in Michigan, her Detroit; in Ohio, her Cincinnati, but in the Hoosier State the Central Union is getting what Sherman called "war all over the State."

Heretofore we have made maps of our partially developed territory, beginning with a spot here and a spot there. After a time, lines would appear connecting some of these spots together, and the lines and spots have so multiplied that it will be much more practical hereafter to reverse this method and leave blank our developed territory, and have spots or desert marks to represent the undeveloped. With such a map, a spot representing a county seat without an Independent telephone exchange, we would have few spots, and no doubt in the near future a spotless map, or the original map of Indiana, representing the developed telephone territory.

The small clouds that have occasionally arisen in the Indiana telephone sky have mostly been troubles among ourselves; some company in difficulty with some other company; perhaps some one encroaching on territory on which others have a prior claim. Telephone territory is such that you cannot maintain a claim and not work it. Usually, most of us have had plenty to do at home to supply service to the endless number of people who are clamoring for it. Those who are in the telephone business should develop their own fields rather than encroach upon others, and those who desire to enter the business should find new fields or buy good stock in some of the many prosperous companies that have lists of people waiting for telephone service. Again many of us take on a troubled look because some well meaning farmers on the outer edge of our county are installing an exchange on their own account

and running right toward our city exchange. If they can furnish that service better and cheaper than we can, or better all things considered, they are the ones to do it. If all things considered our service is better than theirs, and it should be made so; theirs will eventually give way to the improved service. We should not care how near our city exchanges the farmers build their often indifferent lines, only let them understand that we cannot build and maintain our city exchanges in a cheap way, and that we will give them connection with our exchanges only upon terms that are fair to us.

Another subject I desire to introduce for your consideration—one that I fear is getting to be a hobby with me—is that of legislation. It seems to me that it is time that this association, or the Central Union Telephone Company, or the people themselves should know something about where we are legally at in Indiana. Here, where telephone development has been the greatest, the most general, our laws setting forth what we may do and what we may not do, are blank.

I have had one of the leading attorneys of Connersville prepare the following act, and I urge that at the next session of the Legislature a strong effort be made by the Association to have a law of this kind enacted:

An act authorizing and empowering the Board of County Commissioners of the respective counties of the State of Indiana to grant permission to any person or persons, voluntary associations and companies engaged in a general telephone business, the right to erect and maintain telephone lines upon and over the public highways of the respective counties of the State, and declaring an emergency.

Section 1. Be it enacted by the General Assembly of the State of Indiana, that the Board of County Commissioners of the respective counties of the State of Indiana are hereby empowered and authorized to grant to any person or persons, or voluntary associations and companies engaged in a general telephone business, the right to construct and maintain telephone lines upon and over the public highways of the respective counties of the State of Indiana.

Section 2. Whereas, an emergency exists for the immediate taking effect of this act, the same shall be enforced from and after its passage.

The delegates, discussing some of the points brought out in Mr. Frazee's remarks, came to a better understanding of the work before them. Mr. Weik, of Greencastle, was recognized and moved that the chair appoint a committee of three to constitute a legislative committee, of which the chair should be a member. He explained that this committee would be empowered to look after the interests of the Independent telephone companies in Indiana before the State legislature. The motion was seconded by Mr. Gilmore, of Greencastle, and when put to a vote was unanimously carried. Mr. Frazee appointed Mr. Gates, of Indianapolis, and Mr. Gilmore to act with the president as the legislative committee.

The treasurer, Harry B. Gates, of Indianapolis, was then called upon to read his report.

Rome C. Stevenson, of Rochester, moved that the treasurer's report be adopted. Hugh Dougherty, of Bluffton, seconded the motion, and it was carried.

The next business before the meeting was the election of officers for the ensuing year. The chair appointed a nominating committee of three to select candidates. Mr. Gilmore, Mr. Rex, of North Manchester, and Mr. Dougherty were appointed. They reported the following nominations:

For President—R. C. Stevenson, of Rochester.

For Vice-President—Jesse N. Weik, of Greencastle.

For Secretary and Treasurer—H. B. Gates, of Indianapolis.

These names were placed before the convention, and resulted in a unanimous vote.

Mr. Frazee, the retiring president, introduced Mr. Stevenson, who presided over the rest of the proceedings. Mr. Stevenson recognized Mr. Dougherty, who spoke to the association at length relative to the litigation that had been carried on by the National Association. He stated that it was expected of the Indiana Association that it raise \$2,000 as its share of funds for the continuance of this litigation. He asked that it con-

tribute \$1,000 of this in cash and the remainder at such time as the National Association might demand.

Mr. Rex moved that a committee be appointed in the different parts of the State to see to the collection of this money. The motion was carried, and the chair appointed Mr. Rex and Mr. Sale, of Indianapolis, as a committee to solicit among the members present.

The chair recognized Mr. Frazee, who introduced the following resolution:

Whereas, A number of Independent telephone companies in the State of Indiana have granted to certain other Independent companies connection with their exchanges without first entering into an explicit written contract governing such connections;

And, whereas, In many cases such arrangements have led to much confusion and the violation of written contracts heretofore entered into by Independent telephone companies and has occasioned litigation and encouraged attacks upon the doctrine of the right to Independent telephone companies to control their business by contract;

Therefore, be it resolved, That the Independent Telephone Association of Indiana condemns the practice of granting such connection other than by explicit written contract, in which each company shall have the right to refuse business which shall tend to violate its existing contracts; and, be it further

Resolved, That the association recommends that each Independent telephone company in this State shall refuse connection with such companies as have been organized and are operated in cities, towns and communities already supplied with Independent telephone service, and which, after such organization, attack the doctrine of the right to control the telephone business by contract.

On motion of Mr. Gates, seconded by Mr. Gilmore, this resolution was unanimously carried.

There being no further business before the convention, it was moved, seconded and carried that the meeting be adjourned.

ATTENDANCE AT INDIANAPOLIS.

The following is an incomplete list of the operators present at the Indianapolis Convention:

F. G. Gilmore, Greencastle; Greencastle Telephone Company.

Jesse W. Weik, Greencastle; Greencastle Telephone Company.

H. B. Sale, Indianapolis; New Telephone Company.

J. A. Moriarity, Indianapolis; New Telephone Company.

H. B. Gates, Indianapolis; New Telephone Company.

Hugh Dougherty, Bluffton; United Telephone Company.

James B. Sale, Bluffton; United Telephone Company.

O. Rex, North Manchester; Home Telephone Company.

Rome C. Stevenson, Rochester; Rochester Telephone Company.

H. L. Oldfather, Silver Lake; Mutual Telephone Company.

Sherman King, Greencastle; Home Telephone Company.

James B. Wilson, Shelbyville; Shelbyville Telephone Company.

L. A. Frazee, Connersville; Connersville Telephone Company.

A. M. Chance, Connersville; Superintendent of Construction.

W. T. Jackson, Rushville; Rushville Co-operative Telephone Company.

Ira Cadwallader, Rossville, Ill.; Cadwallader Telephone Company.

MANUFACTURING REPRESENTATIVES PRESENT.

Evan S. Shelby, representing the Sterling Electric Company, had a very fine display at the Hotel Denison, where he entertained many of the delegates.

O. M. Carman and F. G. Balz, representing the Robert L. McQuat Company, were on hand with a complete line of samples.

W. T. Heddon, of the Stromberg-Carlson Telephone Manufacturing Company, had a good exhibit. When he could not interest prospective buyers he gave a coin manipulation side-show that was sure to attract a crowd.

K. V. Murry represented the American Electric Telephone Company.

E. C. Lewis represented the Stromberg-Carlson Telephone Manufacturing Company.

Kendall W. Johnson and Mr. Mason represented the Universal Telephone Receiver Holder Company.

George S. DuPerow represented the Norton Tool Company, of West Park, Ohio.

J. A. Russell, of the Hipwell Manufacturing Company, of Allegheny, Pa., and Chicago, is said to have secured lots of business.

F. L. Martin, the advertising manager of the Kellogg Switchboard and Supply Company, had an automobile on hand. He greatly increased his popularity by giving everybody a ride to the exchange and around town.

George W. Rodormer represented the American Electric Fuse Company.

A. V. Overshiner, representing the Swedish-American Telephone Manufacturing Company, tendered a musicale and a good luncheon to his friends and patrons at the Hotel Denison. He had a good display of his company's products on hand.

SOUTHEASTERN IOWA ASSOCIATION CONVENTION

ON THE same day that the Mutual telephonists of Indiana met in Indianapolis another Independent telephone association was in session at Oskaloosa, Iowa. This was the Southeastern Iowa Independent Telephone Association, and it was their fourth annual meeting. When they assembled, the president of the association, C. B. Dibble, of Sigourney, made a brief address. The following is the substance of his remarks:

"I feel that we are to be congratulated upon the work we have accomplished, and encouraged to push forward in the future. Many changes have taken place during the past year, generally resulting in our betterment. Some of the changes have required a change in our former tactics, notably the change in the attitude of the Bell company toward many of us, in such matters as trying to stir up a strife between the farmers and our systems, joining them in cut rates to common points, etc., all of which will no doubt be fully discussed during our meeting and plans made to offset the evil effects of this underhand business. We have many other matters in which we are all interested, the most important being some simple clearing-house plan that we can all adopt. I would here suggest that we center our energies on this matter, as through this medium alone can we expect to get the full earnings of our lines. But we must not expect completeness in the beginning—our plans will of necessity have to be altered and sifted to our needs."

Mr. Dibble then explained that, as several important papers were to be read, and that it was desirable to have a full discussion of these papers, the regular business would be postponed

until the next morning in order to give some of those who were expected to be present time to get there.

Here ensued a very spirited discussion brought on by Mr. H. E. Pancost, of Ottumwa, who made a very plain statement of the conditions prevalent. He criticized the inactivity of the association, its promises and lack of results. His remarks particularly referred to the lack of toll lines and inefficient service on toll lines that were in use. Every one joined in, and it was noticed that a hearty sentiment was in evidence for the betterment of these conditions, the building of new lines and better, etc. This discussion lasted for about three hours, and much good from it is inevitable. An adjournment was then had until 8 p. m.

When the convention assembled in the evening the regular order of business was not taken up, but a general discussion of affairs and conditions in the territory covered by the association was indulged in. A resolution was introduced and passed to appoint a committee to treat with neighboring Independent companies who were not members of the association for the construction of good toll lines. It was asserted that these companies either would not construct toll lines or that their toll construction was so poor and the operation was so unsatisfactory that it was almost as bad as no lines. This committee was given full power to act in any way it should see fit. It could refuse connections if necessary and see that all new construction was of the best and standard type. An adjournment was then taken until 9 o'clock the next morning.

At the morning session, on the 15th, the regular business was taken up. The following officers were elected unanimously for the ensuing year:

President, Dr. H. S. Herr, of Ottumwa.

Vice-president, W. H. Fowler, of Pella.

Secretary and treasurer, F. W. Kelly, of Oskaloosa.

The president appointed a toll line committee to look after proper construction, etc., as follows: W. D. Dinsmore, of Oskaloosa; H. E. Pancost, of Ottumwa; C. B. Dobie, of Sigourney; Thomas Dupye, of Washington, and J. S. Bellamy, of Knoxville. An executive committee also was appointed as follows: H. C. Raney, of Fairfield; C. M. McFatridge, of Moravia, and G. M. Heiserman, of Albia. This committee was given power to call as many meetings annually as it should deem necessary and to arrange programmes for such meetings. The delegates present thought that a remedy for existing conditions would be to have more meetings yearly. The general consensus of opinion seemed to be that at least four were necessary.

Several papers on the regular programme were then read and discussed.

H. C. Raney, of Fairfield, read a paper on, "What Is This Association For?" His paper was a scathing indictment of the inactivity of the association. He said that no results seemed to be obtained whatsoever. He wound up with an appeal for some action to be taken to further the interests of the Independent companies represented in the association.

W. H. Fowler, of Pella, read a paper on, "What Is a Toll Line?" His talk was one of the most interesting and instructive at the meeting. He told in a clear, concise way how toll lines should be constructed. He said that they should be through lines—that is, lines giving through connection from one exchange to another. So many of our so-called toll lines, he said, are merely farmer's lines, with anywhere from ten to twenty, or even more, stations connected on them, making it almost impossible to secure connection between the exchanges. He pointed out that what the people wanted was toll lines; that is, lines giving them quick and good connection between the various towns. Until this was done, he added, not much success could be had by the companies represented in the association. He said that these lines should be built of the best materials and of perfect construction, and used for long-distance work only, and that they then would bring in revenue.

C. M. McFatridge, of Moravia, read a paper, "Flat Rate on Toll Lines." He objected to the present system of flat rates on the toll lines as being fundamentally wrong. He said the practice of giving long-distance service to subscribers for so much a month or so much a year did not pay, and it should be corrected.

C. B. Dobie, of Sigourney, read a paper on "Time Limit on Toll Lines." This topic has lately been much to the front in the telephone industry. Mr. Dobie's paper, in substance, is as follows:

"I feel that in selecting this subject for my topic a burden has been placed on me that I am poorly prepared to cope with. But, having unbounded faith in my fellow telephone men to come to the rescue, I will launch the subject. The importance of a time limit is unquestioned. The difficulties that I fear we would labor under would be fair and impartial enforcement of a time limit. There are times when a long talk appears to work no inconvenience. While, of course, this is partly assumed, because we do not know but some "timid" operator may be waiting for our long-winded individual who is grinding away. Again, it may be some particular patron who is usually very short in his talk and whose business we do not wish to hazard, who, by force of unavoidable circumstances, is occupying more than the customary length of time. These and the use of questionable discretion on the part of the Bell agents makes it often a delicate matter to demand overtime. I fully believe in the necessity of a time limit, but it is a matter on which I would rather receive than give advice. It is a matter I very much fear a large portion of our patrons would resent, at least at the start. We are at present putting up a fight to maintain standard rates, while the Bell, through the farmer, is making 5-cent rates to common points, which fact would, I fear, work a hardship if we attempted to rigidly enforce a time limit. Yet there is reason in all things, and, while it may appear hard-hearted, we do not encourage lovers' calls, nor do we claim to excel in matters matrimonial. However, we propose to conform to association methods, and will abide by the association's decisions, not only in this matter, but all others that tend to better our conditions and the service."

H. E. Pancost, of Ottumwa, read a paper on "Farmer Lines." He gave a brief resumé of what had been accomplished in farmer lines, and said that there was ever an increased demand from farmers for this class of service. He said that if this business was conducted in a business-like way, universal satisfaction would be given to both the farmers and the other patrons of the exchange, and that there was money in it if it was conducted on a practical business basis.

Dr. H. S. Herr, of Ottumwa, read a paper on "Toll Lines." His paper was also devoted to a plea for better construction and better service, which, he said, was absolutely necessary to the proper growth of the Independent companies in Iowa.

A committee was appointed consisting of H. E. Pancost, of Ottumwa, and W. D. Denison, of Oskaloosa, and they, after due deliberation, decided on a five-minute limit to toll conversation, this rule to go into effect on January 1. This system was accepted by the convention. The meeting then adjourned until 7 p. m., when, for several hours, various local conditions were discussed and remedies suggested, after which it adjourned.

ATTENDANCE AT OSKALOOSA.

The following are some of those present at the convention of the Iowa Independents:

G. W. Smith, Brighton; Brighton Telephone Company.
S. S. Lichty, Vinton; Vinton and Benton County Telephone Company.
W. H. Fowler, Pella; Fowler Telephone Company.
F. W. Kelly, Oskaloosa; Oskaloosa Home Telephone Company.
W. D. Dinsmore, Oskaloosa; Oskaloosa Home Telephone Company.
H. E. Pancost, Ottumwa; Ottumwa Telephone Company.
W. E. Bryan, New Sharon; New Sharon Telephone Company.
J. S. Bellamy, Knoxville; Knoxville Telephone Company.
C. M. McFatridge, Moravia; Moravia Telephone Company.
C. B. Dobie, Sigourney; People's Telephone Company.
G. M. Heiserman, Albia; Albia Telephone Company.
J. T. Brooks, Hedrick; Hedrick Telephone Company.
H. S. Herr, Ottumwa; Herr Construction Company and Ottumwa Telephone Company.
H. J. Seifert, Eddyville; Eddyville Telephone Company.
Thomas Dupye, Washington.

MANUFACTURING REPRESENTATIVES.

W. R. Hind, State representative of the Kellogg Switchboard and Supply Company, Chicago, was at the convention.
P. J. Hertz represented the Williams-Abbott Electric Company, of Cleveland and Chicago.
J. W. Hardy was at the convention in the interests of the Western Electrical Supply Company, St. Louis.
William Bowen, State representative of the Stromberg-Carlson Telephone Manufacturing Company, Chicago, was on hand to look after his company's interests.

OPENING FOR INDEPENDENT CAPITAL

CONSUL JONES at Funchal on the Island of Madeira, has sent the following report to the State Department:

"The last census gives Funchal a population of 50,000 people. The city is spread over a large area, stretching up and down hill, and yet it has no public telephone.

"The postal service is not of the best. The common communication is by note and messenger. Several of the leading business houses have private telephones. The different villages of this island have telegraph and postal communications with this city. A wire connects with the lighthouse at Point St. Lorenzo, twenty miles away, and gives news of approaching steamers from the north about three hours before their arrival.

"The local telegraph charges are 6 cents for the first word, and 1 cent for each additional word. The postal service is tri-weekly, and the mails are carried on foot.

"It seems to me that here is an opening for an enterprising American. An English company got the concession for the electric light plant, and I understand it pays well."

A TELEPHONIC RELATIONSHIP

He.—They tell me that your friend, Madge, is connected with the best families in Detroit.

She.—Yes—by telephone.—*Detroit News.*

FOREIGN CURRENTS

AMERICAN telephone manufacturers will do well to turn their attention to South Africa as a field for future business. When things settle down to their normal state in the Cape Colony, Natal, the Transvaal and the Orange River Colony, as they no doubt soon will, there will be a great revival in trade in that enormous territory, and since modern industry demands telephone service as a necessary part of its machinery there will be a big demand for telephone apparatus and material. Apparently there has been little done so far in the way of telephoning the South African cities, but with the end of the war and an indefinite period of peace and stable government in sight, a determination seems to have arisen in every place to get up-to-date as quickly as possible. Presumably this means a complete modern telephone system in every town, so there is plenty of business in sight. For example, acting upon the report of the borough electrical engineer, the Durban telephone committee has decided to forward requisitions for cables, poles, wires and exchange equipment, and has sanctioned the proposal that the Telegraph Manufacturing (Colonial) Co., the Western Electric Co., and the L. M. Ericsson Co., of Stockholm, be invited to forward particulars and prices. The report was referred back to the council in committee for further consideration, the mayor remarking that the total cost would amount to \$400,000. Friction has now arisen between the government and the corporation, as the former has in hand a project for establishing an exchange of its own to connect all government departments and military and transport offices, and later on all other government departments in the colony. It is pointed out that the two schemes are quite unnecessary, and if that of the government is persevered with it will seriously interfere with the corporation system. That, however, is a minor point. The fact of interest is that there will be millions of dollars of telephone work to be done in South Africa in the next few years.

* * *

The following little account of a telephone law suit in London throws a side light on the difficulties under which telephone work is carried on in that city. The National Telephone Company sued a Mr. John Lang for \$17 or the return of a telephone instrument belonging to the company. The defendant put in a counter claim for \$24. It appeared that Mr. Lang had made a five-year contract for telephone service at the rate of \$65 a year. The company had connected the line to the premises on July 4, 1900, and had given service for a little over two months. Then strong objection was taken by the neighbors to the line crossing their premises, and such pressure was brought to bear on the company that they had to remove the line and were subsequently unable to supply the connection. In April last the company, finding they could not carry out the agreement wrote terminating it, and asking for the return of the instrument. The defendant stated that he had had no notice terminating the contract which he considered still in force. As the company could not prove service of the notice terminating the agreement the judge found for the defendant, remarking that the company had probably put up the line without getting the necessary way leave from the neighbors. On the trial of the counter claim the defendant said that he had had to spend about five dollars to notify people that he was no longer on the telephone, and that he had had an unsightly pole standing in his garden ever since the telephone was first put in. The result was a victory all along the line for Mr. Lang, judgment being given for him on the original action, and \$15 being awarded him on his counter claim for damages. Query, what will Mr. Lang now do with the National Company's instrument which he evidently retained for two years after the wire was disconnected?

* * *

The curious telephone situation that has arisen in London through the decision of the Post Office to establish a competing system and the agreement between the Post Office and the National Telephone Company which made the competition purely a matter of form continues to give rise to all sorts of difficulties. Complaints of the service on connections between stations on the two systems are deep and bitter, and of course the Post Office says it is the company's fault and the company says all the trouble is with the Post Office. Under the agreement the Post Office was to provide the company with underground wires,

which in most parts of London the company is unable to put down for itself as it lacks the necessary powers for opening the streets and cannot get the consent of the local authorities to do so. As soon as the agreement was concluded the company wrote to the Post Office asking for several thousand miles of underground wire, but so far it has not got them, and in writing to the papers in defence of the various complaints made of the service the company says that the lack of wires is the cause of many of the troubles and that it has no assurance from the Post Office that the underground wire facilities promised by the Post Office and so much required by the company will soon be supplied.

* * *

This promise on the part of the Post Office to furnish underground wires to the National Telephone Company seems to be the feature of the agreement that has most aroused the ire of the various local authorities in London, who are intensely jealous of their powers over the streets, while they also seem to have a vindictive grudge against the National Telephone Company which impels them to force the company to depend on overhead wires exclusively, with all the difficulties and inconveniences that overhead telephone work in cities entails. This spirit goes so far that some of the local authorities are opposing the laying of Post Office telephone conduits in their boroughs at all, apparently on the ground that if there are no conduits laid none can be leased to the National Telephone Company! The borough council of the Battersea recently convened a meeting of local authorities to consider the question of offering organized obstruction to the laying of the Post Office conduits. Out of twenty-seven local authorities invited only eight sent delegates, and as the Postmaster-General invited the council to send a deputation to discuss the matter with him before further proceedings were taken it was decided to send a deputation. From all the numerous and various difficulties that the English electrical papers make note of regarding the London telephone service, it looks as if London would never have an adequate and efficient telephone service until some American telephone man goes over and makes a clean sweep of the whole business! Perhaps when Mr. Yerkes has finished his work of Americanizing the London underground railroads he will enlist some American telephone men under his conquering banner and take the telephones in hand. Certainly there is no greater field in the world for an immense telephone development than there is in London.

The Arrester.

THE WONDERFUL GROWTH OF THE TELEPHONE.

THE growth of telephony in the past seven years has been marvelous. The people are coming to look on the telephone as indispensable not only in their business, but in private life as well.

New York City, although it has not had the advantages of competing systems, which naturally tend to lower rates and better service, has yet increased its telephone facilities enormously. As a greater number of telephones are in use in New York than any other city, it may be interesting to study the following figures showing the increase by years from 1893 to January 1, 1902.

Year.	No. of Stations.	Yearly Increase	P. C. of Inc.
1893.....	9,093	...	..
1894.....	9,981	888	10
1895.....	10,435	454	5
1896.....	13,269	2,934	28
1897.....	16,786	3,417	26
1898.....	21,535	4,749	28
1899.....	27,007	5,472	25
1900.....	37,716	10,709	40
1901.....	51,571	13,885	37
1902.....	72,159	20,588	40

Since these figures were compiled, the New York Telephone Company claims that its system now embraces at least 87,000 subscribers.

Opinion and Comment

FINANCING NEW CONSTRUCTION

A MUCH mooted question is that of financing a telephone company. It is still a vexed question, a really satisfying solution never having been reached. A telephone company in one city or town meets conditions widely different from what another company in another place faces. A system of finances has, in a sense, therefore, to be adopted to meet local conditions. But there are several phases of finance that are the same in one place as in another. And among them is the question of providing funds for extensions.

In a prosperous town a well-managed telephone plant is surely bound to expand. It cannot properly serve the public by standing still. New business being established, new industries springing up, the people being educated to the use of the telephone, all these things and others bring new subscribers to a telephone company. They must be cared for and given connection. Consequently in a short time the capacity of the original installation has been reached. The directors of a company have then the following situation to meet: They must enlarge the capacity of the plant. Either they must suspend paying dividends or they must issue new stock. It is the opinion of a large number of practical telephone men in the Independent ranks that the system of taking the profits of a telephone plant and putting them into new construction and extensions is radically wrong. It is indeed true that many large corporations, other than telephone companies, have been built up, and have flourished and prospered under the non-dividend paying system. The non-dividend paying corporation is invariably one that requires a small amount of capital, comparatively speaking. It only has a few stockholders, or its field is limited, and the limit is well understood by its managers.

A modern telephone plant, on the other hand, usually has a large number of stockholders—the majority of them having only small holdings. Its possibilities of development and expansion are boundless, and always far exceed the most enthusiastic conception of its most optimistic projectors. And as it expands, new capital is required. This makes a telephone property, as we are often told, the most peculiar investment in the world of finance.

The large stockholder, so long as he is satisfied that the investment is a safe one, is content to see the profits that should be paid as dividends, go into new construction, for it makes his holdings so much more valuable, and he usually can afford to wait for the dividends. But the small stockholder looks on it from a different viewpoint. If he puts in from \$500 to \$1,000, or perhaps more, he very naturally expects this to pay him immediate dividends. He doesn't want to see all the profits out of which he should get a dividend on his investment be eaten up in new construction. But if, on the other hand, he should be paid a dividend, it is more than likely that in nine cases out of ten he would re-invest the dividend in the company. The dividends which he gets from the old investment give him confidence in the property, and he is ready and willing to put more money into it. In this way the company usually gets back the greater part of the dividends that are paid out, and at the same time gains the confidence of investors.

If it is generally understood that the profits of a telephone plant, instead of paying dividends, are put back in to provide for new construction and extensions, capital is naturally backward about investing in the concern. It does not look like a good investment. But if dividends are paid regularly, when new construction is imperative, there will be no difficulty in persuading new capital to invest.

RATES AND CONSTRUCTION

TWO points which cause more trouble to new telephone companies than anything else are rates for service and the way the system is constructed. On a proper decision of these two questions depends the very life and prosperity of the new company. In fixing a charge for service a new telephone company seldom takes into consideration the cost of operating, amount of depreciation, or amount of money on which interest has to be paid. Instead, it takes as a basis the rates charged by another company in another locality where the conditions are entirely different. The result is often operation at cost or often at an actual loss.

As has been frequently pointed out in the *AMERICAN TELEPHONE JOURNAL*, there is no standard fixed basis on which telephone rates may be computed. A company in one town may charge higher rates for its service than a company in another place with the same number of subscribers and the same quality of service. And yet the charges of both companies may be perfectly fair. They have different and varying conditions to face, and their rates must be fixed accordingly. So that it can easily be seen that a new telephone company, instead of basing its rates on those of another company, should carefully consider every item of expense that will be incurred, and so fix a rate that will return a reasonable profit.

Another mistake that is too often made is that of using poor construction. Volumes have been written condemning this practice, but until the lesson is heeded, too much cannot be written on this line. Poor materials, and slipshod construction, will inevitably lead to the downfall of a telephone company unless it is quickly remedied. And even then it seriously impairs the life of the new company. Its system was originally constructed in the poorest manner. This may work well for several months or possibly a year. But when it once commences to deteriorate it seems all to go to pieces at once. The managers are then brought face to face with the alternative of either going out of business and losing the money invested, or of re-constructing their property in a good, substantial, modern way. Thus the money that was put into the initial construction is money thrown away, which, if put into good construction in the first place, would by this time be paying dividends.

What a new company should do is to see that the plant is originally constructed of good materials and according to standard specifications, and built with a capacity large enough to take care of all possible future requirements. Although this is vastly more costly in the beginning, in the end it will actually save thousands of dollars.

IN THE OPERATING FIELD

LOS ANGELES SYSTEM

THE Home Telephone Company, of Los Angeles, Cal., is rushing the construction work on the new system for that city. Nearly all the underground conduit work has been completed. Mr. Hummel, of Toledo, Ohio, is now installing the cables. The company is at present wiring subscribers' houses and offices for the instruments. There are now nearly 11,500 subscribers on the books. Nearly 5,000 poles have been set, cross-armed and painted, and the guying has been commenced.

In the wiring of the pole lines for the Home Company a novel feature has been introduced by Engineer Zahm. He places pins on both sides of a ten-pin cross-arm, using a special insulator for the under pin. The pins are placed directly under each other and a clear space of ten inches is allowed between every wire and on every side. This is much superior to the method employed by the Pacific States Company on its pole lines. This company uses twenty-two knobs on a standard ten-pin arm, and as a consequence the wires are very close and trouble is frequent.

The Pacific States Company is arranging for a general rate reduction, and will, it is said, entirely remodel its system. At present it has a common battery calling and local battery talking system. Its plant is divided into branch exchanges, the whole having an ultimate capacity of 8,000 lines. When the plant is rebuilt, these branch exchanges will be abandoned and the entire system operated from a main exchange of 9,600 lines capacity, complete multiple common battery system.

The Bell Company is now drawing in more underground cable, its new building has been completed, the switchboard has arrived and is being installed. But notwithstanding all this, the sentiment of the Los Angeles people is almost as a unit in favor of the new Independent company, and it gets credit for causing any improvements in the Los Angeles Telephone service. The Bell company has commenced its improvements too late, and it is sure to be far outstripped by its enterprising young rival.

ILLINOIS TRAFFIC ASSOCIATION

REPRESENTATIVES of twenty-three telephone companies of Western Illinois met at Jacksonville recently and prepared for the organization of the Illinois Telephone Traffic Association to handle the interchange of telephone traffic between the Independent companies and private interests of the Independent telephone lines. The companies represented were: Illinois Telephone Company, C. F. Tonn; Cass County Telephone Company, J. G. Pratt; Boynton Telephone Company, E. D. Boynton, Pleasant Plains; Pike County, E. D. Glandon; Waverly, W. B. Rodgers; Modesto, James A. Fletcher; Madora, James F. Still; Shipman, M. M. Meatyard; Brighton, Walter G. Hunt; Macoupin Telephone and Telegraph Company, H. R. Lehr; Girard, J. E. Huff; Goodhead, George E. Goodhead; Winchester, Hettick, P. T. Doty; Auburn, W. H. Ramsey; Farmers' and Merchants' of Griggsville, Angus Orr; Fayette, William Edelman; Chesterfield, W. J. Finch; Scottsville, E. O. Turner; Mt. Sterling, Edwin Pendleton; Piasa, E. H. Forwood; Rock Bridge, E. S. Barnard; Kemper, L. B. Ruggle; Illinois Western, C. M. Ervin.

NEW SWITCHBOARD FOR ROCHESTER COMPLETED

THE old switchboard of the Rochester Telephone Company has been abandoned, and the new one is in operation. Last year the old switchboard of the company had nearly reached its ultimate capacity, 5,000 subscriber's lines. The company, therefore, saw it was necessary to make some additions, as new subscribers were coming in so rapidly that it seemed Rochester had never had telephonic facilities before the Independent company came there. Either a new branch exchange would have to be built or a switchboard of enlarged capacity installed in the old building. The latter plan was decided on and for very manifest reasons. Probably the most important of these was the fact that if a branch exchange were installed, an entirely new system of conduits would be necessary. This would necessarily involve a very large outlay of cash and result in dissatisfaction

and protests from the public against tearing up the streets. And in case of another exchange a system of trunking would be necessary, making connections slower and more difficult to get, and increasing the operating expense.

But the old building was already overcrowded, and with a larger switchboard, not room enough would be left for turning around. So it was decided that an addition to the central office was imperative. A third story was accordingly added to the building, and here on the top floor with abundant air and light, a perfect operating room absolutely fireproof was formed.

The Stromberg-Carlson Telephone Manufacturing Company was contracted with to furnish a new switchboard with an equipment of 7,500 lines and 10,000 ultimate capacity.

This switchboard has now been completed, and is in operation. Already the 7,500 present equipment is nearly full, and with the improved service given with the new switchboard, the employees of the Rochester company will be kept hustling, filling orders from new subscribers.

MAKES A GOOD SHOWING

THE annual meeting of the stockholders of The Jefferson & Warren Telephone Company was held recently. The report for the year showed a very satisfactory condition. This company is capitalized at \$60,000. It has no bonded indebtedness, and showed, after paying all operating expenses, maintenance and fixed charges, net earnings of over 11 per cent. The company operates six exchanges and many miles of toll lines. The directors for the coming year are C. S. Fenton, G. W. Birrell, Fred Harrington, E. U. Hyde and W. S. Howland.

A SMALL MODEL EXCHANGE

CAMDEN, N. Y., a town of only 2,400 inhabitants, has a model telephone system. It is owned by a young man, Benton Osborne, who had the foresight to see that the best initial construction, although more costly than shoddy construction, would in the end be the better investment. Keeping this idea in view, he went ahead and built his system, using only the best materials, up-to-date construction, etc. His system, the Camden Telephone Company, now serves about 150 subscribers, and many others are on the waiting list. He is badly handicapped by the fact that he lacks capital to make many needed extensions of his system so as to give service to these new patrons who want it badly.

The system he now operates, however, represents the very best installation for a small exchange. He has up-to-date switchboards, modern cables, distributing boards of the latest type, power generators, and all his telephones are long distance instruments of good construction. He has toll connection by metallic circuits with all the nearby towns and cities, and has laid plans for constructing many other toll lines.

JUSTICE UP-TO-DATE

A JUSTICE of the peace out in Fort Morgan, Colorado, is a firm believer in the general utility of the telephone. This is clearly shown by the following story, which originally appeared with scare heads in a Colorado newspaper.

A merchant and a farmer during a business transaction, became rather heated. The merchant, who was said to be of rather a pugnacious disposition, ended the altercation by kicking the farmer out of his store. Naturally the farmer took serious offense at this violent treatment, and promptly had his erstwhile business associate arrested.

The merchant, however, took refuge in his telephone, and informed the above referred to justice that so pressing were his business engagements that he had no time at present to stand trial. The judge insisted on an immediate trial, and the merchant was equally firm in his refusal.

The telephone was finally settled on as a compromising agent, however. The merchant pleaded guilty to the charge, and the judge in a tone rendered less stern and harsh over the magic wire, imposed a fine of \$5. Here his faith in the efficiency of the telephone apparently came to an end. For he insisted that the five dollars be transmitted by mail.

QUERIES

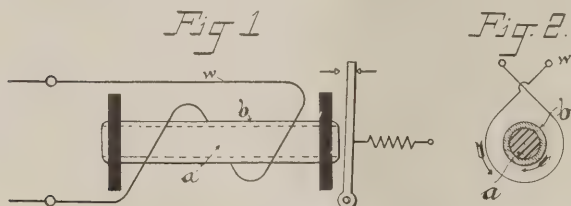
Conducted by William W. Dean

AN ALTERNATING CURRENT RELAY

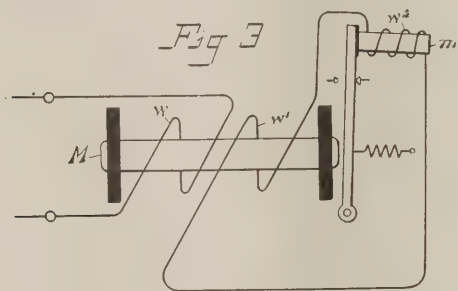
"I would like to know if any relays have been designed so as to respond to direct current but not to alternating current; that is, the current delivered from an ordinary hand generator? If any relay of this kind has been designed I would like to know the construction of same."

Figures 1, 3, 4 and 5 represent the most commonly used methods for obtaining a relay which will operate on direct current and not on alternating current.

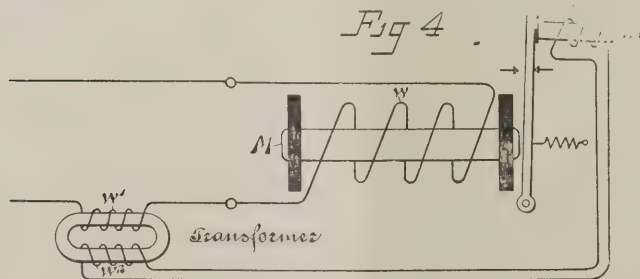
Figure 1 is the one most generally used. In Fig. 1, a copper



tube *b* is tightly driven over the core *a* for its entire length. When alternating current flows through the winding *w* of this relay, tending to operate its armature, an opposite current is induced in the copper shell, thereby neutralizing to a marked extent the effect of the original current. A cross section of the core of this relay is shown in Fig. 2. When current flows through the winding *w* in the direction of the arrow, an opposite current is generated in the copper shell *b* in the direction



of the arrow. Of course, for this relay to be absolutely neutral to alternating current it would have to act as a transformer of 100 per cent. efficiency; inasmuch as the magnetic circuit of most relays is extremely faulty on account of the open air gap at the armature, this condition is impossible, especially for currents of as low frequency as the ordinary hand generator. The amount of copper, resistance of winding, the diameter of the core, etc., would have to be varied to suit varying conditions. With direct current there would, of course, be only a momentary

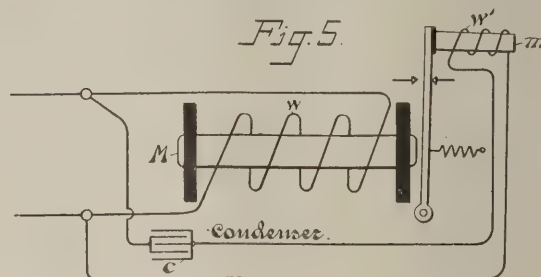


current generated in the copper shell, which would not prevent the relay from working.

Fig. 3. shows a second form of relay which is very effective. The core of the magnet in this relay has two windings *w* and *w'*, and the armature is provided at its end with a small holding magnet *m* provided with a winding *w''*. It will be seen that when alternating current is sent through the winding *w*, an in-

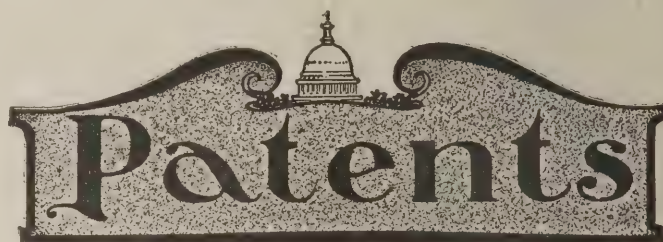
duced current will be produced in the winding *w'*. This current will flow through the holding magnet *m*, thereby energizing it and preventing the armature of the relay from drawing forward.

Fig. 4 represents practically the same scheme except that the transforming of the original current is done by means of a

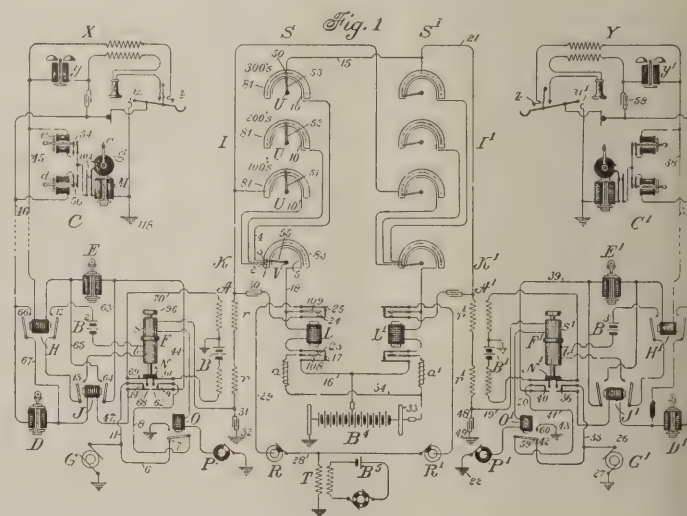


separate transformer in windings *w'* and *w''*. This method is much more effective, but is, of course, more expensive.

In Fig. 5, the original alternating current flows through the winding *w* of the magnet *M* and part of the alternating current flows by way of the condenser *c* through the winding *w'* of the magnet *m*, thereby preventing the armature from working. It is evident that inasmuch as direct current will not flow through the condenser *c*, the relay will operate with it



A. M. Bullard, of Somerville, Mass., patents (No. 709,739, September 23, 1902), and assigns to the American Bell Telephone Company an automatic telephone exchange. The principal features of this invention which distinguish it from others of similar character are the use of alternating current waves to actuate and operate the selective and connecting mechanisms; the division of the subscribers' numbers into two parts, the "hundreds" being in one part and the "tens" and "units" on the



other, and also the use of a self-centering selector arm to compensate for any deviations from perfect synchronism.

At the subscriber's station is the ordinary apparatus such as is used in any modern telephone system, and, in addition, is a dial and pointer for selecting the numbers and two buttons for operating the mechanism which moves the "hundreds" pointer

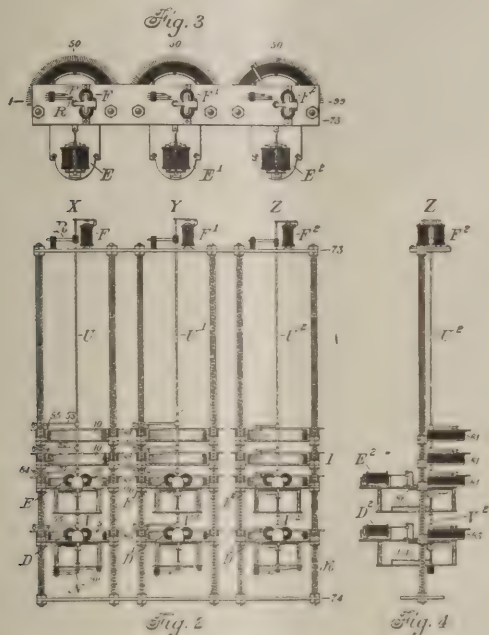
or "tens and units" pointer. These are shown in Figs. 7 and 8.

At the central each line has a machine equipped with dials and movable arms, (Figs. 2, 3 and 4), the divisions on these corresponding exactly with those at the subscribers' station, as they are supposed to move in exact synchronism with them, (Figs. 5 and 6.) A simple description of the method of operating is as follows, shown in Fig. 1:

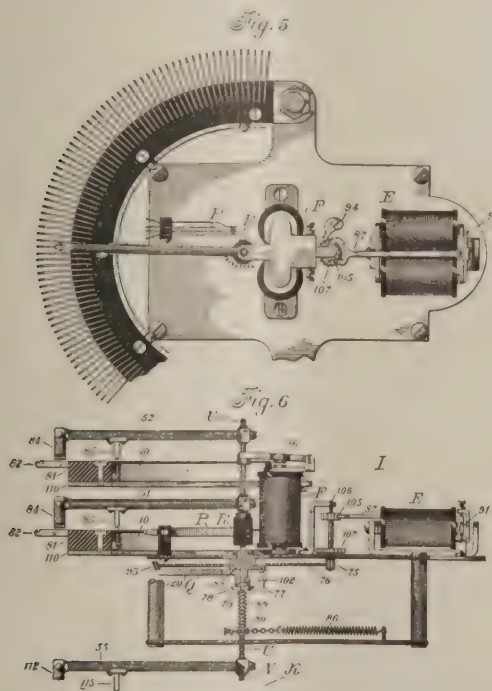
Station X desires connection with station Y, whose number

is brought to the bar or strip 50, thus being in position at 350. When the receiver is removed at X, contact is made at z and a , passing contact at u . This causes the current from G to operate the relays H and J, which in turn operate the magnet F and switch N, depressing the revolving arms and making the necessary contacts. The magnets D and E are short-circuited at this moment, which prevents any further motion of the arms.

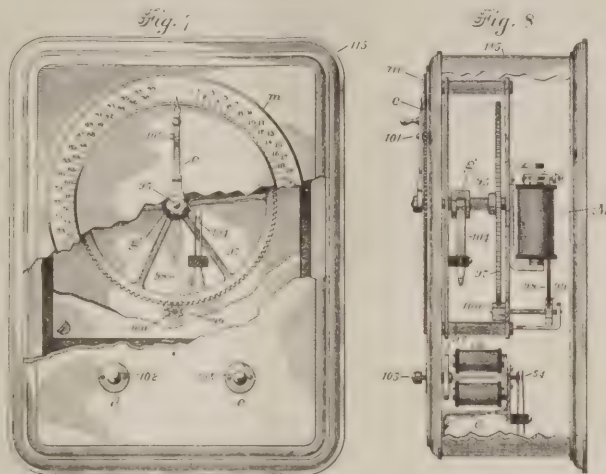
Should the line 350 be busy, the relay L will fail to operate, but a buzz or hum will be sent back to X from the interrupter and coil at T. Should 350 or Y be clear, the relay L throws onto the circuit the entire 24 volts of the battery B⁴, which op-



is 350. The dial at X is first pushed to 3 (representing the "hundreds") and the button *d* is pushed. As the dial has been moved, the contact 104 is closed, and a circuit is therefore made through the instrument at X and through the magnet D to the alternating current generator at G, thence to the earth, the instrument at X being also grounded. The alternating current passing through the magnets D and M, vibrates their armatures in synchronism, and the dial at X is returned to its normal po-

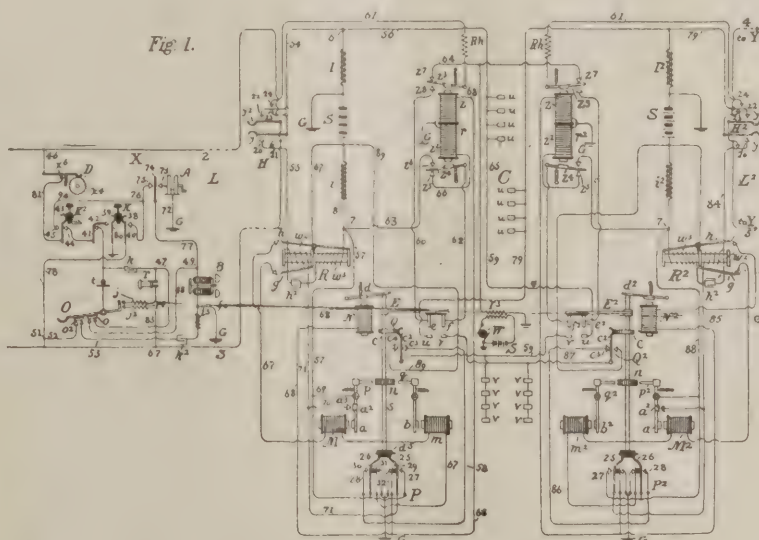


sition, while the arm at central is moved up three bars or connecting strips, which places in position the third "unit and tens" mechanism. The dial at X is now moved to 50, completing the number 350, and the same operation ensues, excepting that the button *e* is pressed instead of *d*. This operates on the magnet E instead of D, and the lever on the third row



erates on the relay O. This causes Y's bell to ring, and as the receiver at Y is lifted the magnet F¹ operates switch N³, which stops the ringing, and conversation may be had between the two stations through the repeating coils A and A¹.

Albert M. Bullard and Malcolm C. Rorty, of Somerville, Mass., patent (No. 709,740, Sept. 23, 1902) and assign to the American Bell Telephone Company an automatic telephone exchange system and apparatus. This invention is an improvement upon a previous application, and applies especially to party line systems, and is operated entirely by a direct current, the arms being affected by a make and break impulse sent out by the dial pointer. On account of being used on party lines, it is



necessary to remove the receiver and listen before commencing the operation of calling.

An important feature of the invention is that any station of the party line when engaged in conversation cannot be interrupted by another station calling another member of the same party line. It is also so arranged that the calling of a certain station of a second party line will not affect the station having a similar number on the first party line.

Fig. 1 shows the central station connections for two circuits and the sub-station connections for one of them.



New Companies

STEWARDSON, ILL.—The Stewardson Telephone Company has filed articles of incorporation with a capital stock of \$2,500. Incorporators: T. P. Mantz, D. M. Duddleston and W. Frede.

SIOUX CITY, IA.—The Iowa Clark Automatic Telephone Company and the Nebraska Clark Automatic Telephone Company have filed articles of incorporation with the County Recorder, and similar articles will be filed in Omaha. The capital stock of each company is \$100,000, with \$10,000 subscribed.

STORY CITY, IA.—The farmers living southeast of town are agitating a rural telephone.

NEW IBERIA, LA.—The People's Independent Telephone Company, Limited, has been incorporated here with a capital stock of \$50,000. The first officers of the new company are R. F. Hogsett, president and general manager; E. S. Broussard, vice-president; Henry D. Giles, secretary and treasurer. Lines will be constructed connecting this place with surrounding towns and villages.

MINDEN, NEB.—The Interstate Independent Telephone Company has filed articles of incorporation with the Secretary of State.

WACO, NEB.—The Waco Telephone Company has been incorporated by J. A. Gilbert and others with a capital stock of \$25,000 for the purpose of building telephone lines in Waco and York counties.

ELIZABETH CITY, N. C.—The Norfolk and Carolina Telephone and Telegraph Company has been incorporated with a capital stock of from \$50,000 to \$250,000. It will construct a line to Norfolk, Va. The incorporators are C. R. Johnson, of Portsmouth, Va.; L. D. Stark, of Norfolk; George T. Wallace, of Norfolk, and M. L. Guirkin, C. Guirkin, Lou M. McCabe, Joseph T. McCabe and George T. War of this place.

GRAND, OKLA.—The Grand Telephone and Telegraph Company has been incorporated with a capital stock of \$25,000, for a period of twenty years. The incorporators are David Selby, T. S. Berran, O. E. Nult, O. C. Newman and S. Y. Cupp. The purpose is to build a telephone line to Gage, Woodward County, and to Cheyenne, Roger Mills County.

NEW HOLLAND, PA.—The Enterprise Telephone and Telegraph Company has been organized to operate in Lancaster and adjoining counties.

CENTER, TEX.—The Telephone business formerly known as the Center Telephone Company of Center and Tenaha, Tex., and the San Augustine Telephone Company of San Augustine, Tex., and 150 miles of toll lines included with said exchanges, was organized and articles of incorporation have been filed, with a capital stock of \$20,000, of which \$16,000 has been issued. Incorporators and directors are: E. C. Branch, of Nacogdoches; W. A. King, Jr., of Center, general manager for a period of five years; James T. Polley, J. W. Saunders, of Center. Improvements and extensions of the lines will be made at once covering eight adjoining counties: Panola, Shelby, San Augustine, Sabine, Newton, Jasper, Jefferson and Nacogdoches. Some of said counties are already connected with the lines of the company. The corporate name of the company is the Sabine Valley Telephone Company. Center is the principal place of business.

SHARPSBURG, PA.—The borough council has passed over a veto of the Burgess an ordinance taxing telephone poles \$1.

Financial

LOS ANGELES, CAL.—In compliance with a provision of the franchise ordinance, Frank F. Graves, the purchaser of the Home Telephone Company's franchise, has made affidavit to the City Clerk of the expenditures made by that corporation. More than \$25,000 was expended the first eight months, and for the first twenty-four months the total expenditure was \$219,119, as follows: Labor, \$45,856; aerial material, \$91,580; underground material, \$35,099; cable, \$46,593.

AURORA, ILL.—The Inter-State Telephone and Telegraph Company has declared the regular quarterly dividend of one per cent. The finances of the company are in excellent condition and the directors are enthusiastic over the future.

MINNEAPOLIS, MINN.—The board of directors of the Twin City Telephone Company have declared a quarterly dividend at the rate of 7 per cent. per annum, payable to stockholders of record Oct. 25.

ALBANY, N. Y.—There have been some transactions reported in Albany Home Telephone securities, but at present it is not possible to establish quotations on the stock and bonds owing to the peculiar situation existing. The bonds put out by the company have been sold at par with a 25 per cent. bonus of stock, so that for each \$1,000 paid for a bond the purchaser has received a present of two and one-half shares of the stock of the company. It is not known that a price for the bonds, minus the stock bonus, has yet been established. For the new stock the company's friends are understood to be bidding \$40 a share, making the allotment of two and one-half shares which went with each bond worth \$100, and leaving \$900 as the value of the bond.

Elections

GREENSBURG, IND.—A meeting of stockholders of the Decatur Telephone Company has been called here for the election of officers.

NEW LONDON, IA.—The stockholders of the Henry County Telephone Company held their annual meeting here recently. The following were elected directors: J. T. Laughlin, James Patten, P. Hillyard, J. E. Peterson, J. L. Portlock, I. W. Martin and James T. Whiting, of Mt. Pleasant.

HEATH, MASS.—The annual meeting of the Heath Telephone Company was held recently at Shelburne Falls. The reports were satisfactory and showed extension of the lines the past year. These officers were elected: Clerk, G. E. Davis; treasurer, Herbert Newell; directors, W. E. Kinsman, of Heath, F. L. Totman, of Conway; F. L. Kendrick, of Colrain, D. G. Taylor, of Jacksonville, Vt., and G. E. Davis, of Shelburne Falls.

Combinations

LARNED, KAN.—The Larned Telephone Company has purchased the old automatic exchange of the Dodge City Telephone Company, and a force of men is at work remodeling the plant and placing it in first class condition. A new Stromberg-Carlson switchboard with a capacity of 200 lines has been installed. One hundred subscribers have already been connected and new ones are being connected as rapidly as possible. A toll line is being constructed between Larned and Dodge City and will be completed next spring. This line will connect all the smaller towns between these two cities and give them toll connection.

SMITH CENTER, KAS.—The Central Kansas Telephone Company, of Oberlin, recently purchased the interest of the Exchange Telephone Company, of this city, in the line between Norton and Oberlin. Under the management of J. H. Young, its superintendent, lines have been recently built from Oberlin to Dresden and Jennings. It is the intention of this company to build lines all over the Northwest where business will justify.

GRAND RAPIDS, MICH.—The Citizens' Telephone Company has purchased Sill's Telephone Exchange at Cadillac. The purchase also includes the toll lines to Lake City, McBain, Falmouth, Vogel Center, Moddersville and Marion, the new owners taking possession at once, with Mr. F. Kooyer as manager at Cadillac. The business was commenced by Mr. Sill in 1894, and has kept pace with the continuous growth of the city. To-day there are 225 telephones in Cadillac and upwards of 75 on the toll lines.

PARK RAPIDS, MINN.—The Citizens' Telephone Company, of Park Rapids, has been sold to the Central Minnesota Telephone Company. The Central Minnesota company agrees to pay all expenses incurred to date, to take all material and also to have the thirty-year franchise possessed by the Citizens' company. The old company binds itself to have nothing more to do with the telephone business in Park Rapids, and the Central Minnesota to give good service without raising the present rates.

BELLEFONTAINE, O.—The United Telephone Company has sold its thirteen miles of telephone lines in Champaign County south of Springhill to Murray E. Weimer. He will conduct a private telephone system in connection with the United States Company.

SANDUSKY, O.—The Sandusky Telephone Company has been consolidated with the Laning syndicate, headed by Jay F. Laning, of Norwalk. It will now be known as the Sandusky Local Telephone Company. The old officers and directors will be retained for the present.

STEBENVILLE, O.—The East Springfield Telephone Company has purchased from the Steubenville Phoenix Telephone Company the Richmond exchange, including franchise and toll lines to Wintersville, and is now at

THE WEEK'S MESSAGES *Continued.*

work repairing and wiring the line between Richmond and Wintersville.

OKLAHOMA, OKLA.—Fifteen of the Independent telephone exchanges of Oklahoma have consolidated under the name of the Pioneer Telephone Company with a capital stock of \$500,000. The consolidation also includes toll lines with an aggregate trunk line mileage of 1,000 miles. The exchanges taken include Oklahoma City, Guthrie, Stillwater, Perry, Newkirk, Blackwell, Arkansas City, Chandler, Ponca City, Yukon and Edmond. The company will have headquarters in this city. J. M. Noble is president and Mr. Coulter, of Chawnee, is secretary of the new company. It has already taken over all of the properties and is now in full control. The company possesses sixty-five toll stations on its 1,000 miles of toll lines. The work of improving the Oklahoma City exchange is in progress, and \$12,000 has been set apart for betterments.

Franchises

OAKLAND, CAL.—W. A. Beasley, of San Jose, whose bid of \$1,575 for the new telephone franchise has been recommended to City Council, appeared before that body recently and submitted a draft of an ordinance to be adopted by the Council, formally accepting the bid and granting the franchise. He said he was ready to organize his company, calling it the Oakland Home Telephone Company. The wires in the business section will be put underground.

SAN DIEGO, CAL.—The Board of Aldermen have denied the petition for a franchise presented by Judge Boone for an Independent telephone company.

HAVANA, CUBA.—It is reported that the House of Representatives has passed a bill granting the National Telephone Company, an American concern, a concession of fifty years' duration for an exclusive telephone service in Cuba.

MARSHALL, ILL.—W. Roy McCanne has been granted a franchise for the construction, maintenance and operation of telephone lines here. He is building a line from St. Louis to Terre Haute, and will make connection with all local companies by the way.

PAXTON, ILL.—The Dix Telephone Company has submitted an ordinance asking for a franchise for the erection of poles and wires in this city.

SANDWICH, ILL.—The Interstate Telephone and Telegraph Company has asked for a franchise to construct and operate a system here.

RICHMOND, KY.—The franchise for a new Independent telephone system in this city has been sold by the City Council to E. Tutt Burnum for \$105. According to the terms of the contract, work must begin on the new plant in ninety days.

ELKTON, MD.—The Maryland Telephone and Telegraph Company has been granted a franchise by the Cecil County Commissioners to extend its line from here to the Pennsylvania line, passing through Cherry Hill and Fair Hill.

HELENA, MONT.—L. L. Moffett, of Billings, has a petition before the City Council for a franchise to construct and operate a telephone system here. He has also asked a franchise at Bozeman, and will in many other towns, his plans being to construct a long-distance line from this State to the Pacific coast, connecting all Independent exchanges en route.

BLASDELL, N. Y.—The Haines Telephone Company has been granted a franchise here and also at West Seneca. Work will be begun immediately. A system will also be constructed along the valley to Springville. The Haines company is also constructing systems in Eden, North Collins and Gowanda, which towns will be connected with Hamburg and Buffalo.

CORFU, N. Y.—The Home Telephone Company has applied for a franchise to allow it to extend its line through this village.

MT. MORRIS, N. Y.—The Trustees have granted a franchise to the Intercean Telephone and Telegraph Company to operate a system in this village.

BAKER CITY, ORE.—The County Commissioners have granted a franchise to Emmet Calahan to erect poles and maintain telephone lines in opposition to the Pacific States Telephone and Telegraph Company. It is said the syndicate back of the new company is composed of a number of men prominent in a business way, who propose to cover the entire county, including this city, with a complete network of telephone wires.

DU BOIS, PA.—The Summerville Telephone Company has been granted a franchise for the occupancy of the streets in this city, providing it furnishes free municipal telephones.

TUNKHANNOCK, PA.—The Centremoreland Telephone Company, which was recently incorporated, has been granted a franchise to construct and operate a telephone system there.

DEPERE, WIS.—H. H. Davenport, representing the Valley Telephone and Telegraph Company, is trying to obtain a franchise here.

OSHKOSH, WIS.—A. B. Ferdinand, of Milwaukee, is here, and will submit a new ordinance for a franchise, giving in detail all his plans, his other petitions having been denied on technical grounds.

Construction.

ARKANSAS CITY, ARK.—J. C. Bonsack, who was granted a telephone franchise, has shipped two carloads of material here for the construction of the line.

BLUE RIDGE, GA.—W. J. Owenby, of the Blue Ridge Telephone Company, is making arrangements for extending the Blue Ridge telephone line to Ellijay. They already have connection with Knoxville, and the Marietta Telephone Company proposes to extend its line from Canton to Ellijay.

BURLINGTON, ILL.—Manager Hussey, of the Hubinger Telephone Company, appeared before the Council here recently. The city had thrown out the police patrol box system, as the service was entirely unsatisfactory. Mr. Hussey stated that he had made an examination and found that the plant needed rebuilding, poor wire having been used in its original construction. He stated that Mr. Hubinger had expended more than \$50,000 in rebuilding the plant in Keokuk and had ordered the expenditure of a like sum for the reconstruction of the Burlington system, work to be begun within two weeks. The work of rebuilding the police patrol system will precede the other improvements if it is authorized by the Council.

CHADWICK, ILL.—People here are discussing plans for the construction of an Independent telephone exchange.

KEWANEE, ILL.—An Independent telephone exchange will probably be constructed here.

MOLINE, ILL.—The Union Electric Telephone Company has commenced to install instruments in this city and is stretching wire strands to support the aerial cables. The plant will be in operation by December 1.

ROCKBRIDGE, ILL.—The Rockbridge Telephone Company, recently incorporated, will soon construct about forty miles of line in this part of the country.

WESTFIELD, ILL.—The Westfield Telephone Company has received a carload of poles. The line to Oilfield will be completed soon. Several new lines will be put up in the near future.

CLAY CITY, IND.—The Clay County Citizens' Telephone Company is constructing a toll line from here to Terre Haute.

HOPE, IND.—Mr. Boman, proprietor of the Hope Independent Telephone Company, is building a new farmers' line.

MANSON, IND.—The directors of the Manson Co-operative Telephone Company have decided to construct trunk lines from Manson to Mechanicsburg and Cyclone.

BURLINGTON, IA.—The Burlington Telephone System will be rebuilt at a cost of \$50,000.

DES MOINES, IA.—The Mutual Telephone Company's managers are figuring on installing a new 6,000-line switchboard which it proposes to install next season. The board is being ordered in contemplation of the extension of the Mutual telephone into the country and the supplying of rural service by party lines. It is probable, too, that if the new board is put in that the east side exchange will be abandoned, the east side lines brought over in an underground cable and the entire business of the exchange handled through one central.

EARLY, IA.—The Farmers' Telephone Company is constructing an exchange here.

NEVADA, IA.—A new telephone line to Iowa Falls is being constructed by F. M. Boardman, of this place, and R. R. Ballard and A. N. Drake, of Radcliffe. It will connect the old and new towns along the Iowa Falls Railroad. The line when completed will be operated by the Story County system.

SUMNER, IA.—The owners of the Rapid Transit Company are constructing a private telephone line from Sumner to Waterloo.

URBANA, IA.—A new telephone line will be constructed through here to Blakesburg.

BAY CITY, MICH.—The Northeastern Telephone Company will have its lines up and connections made as far as Tawas on the Detroit & Mackinac in a few days. When Tawas is reached a new gang will be started, working north on the Michigan Central.

JACKSON, MICH.—The People's Telephone Company, which has recently put in a new telephone exchange here, commenced a line to connect with the rural exchanges at Vandercook's Lake, Clarks Lake and Addison.

MANKATO, MINN.—The Citizens' Telephone Company is building a line to Mapleton.

AUDUBON, N. J.—Representatives of the Eastern Telephone and Telegraph Company have been over the field and have decided to extend their lines to this and adjoining towns.

MT. HOLLY, N. J.—A telephone line between here and Burlington is contemplated in the near future.

THE WEEK'S MESSAGES *Concluded*

FULTON, N. M.—A. A. Dean is erecting the poles for an extension of the Fulton telephone line to Phoenix.

CANANDAIGUA, N. Y.—The Bell Telephone Company is preparing to rebuild its exchange in this village. For years Canandaguans have been appealing in vain for better service, and now the Independent company, promoted by Rochester citizens, has been established, and the Bell company is forced to better its service.

CHARLOTTEVILLE, N. Y.—Work has been commenced on the extension of the Charlotte Valley Telephone Company's line from this place to Jefferson.

ELLCOTTVILLE, N. Y.—A telephone line is being constructed from here to Ashford Junction, Sugartown and Great Valley. From Great Valley the lines have already been extended to Willoughby, Humphrey and beyond Humphrey Centre.

LIVONIA, N. Y.—The Livonia Telephone Company is rebuilding many of its lines here.

MANILLA, N. Y.—The Frontier Telephone Company will put up a line connecting this village with Attica, Cowlesville, Elma and Porterville.

UNADILLA, N. Y.—A new long-distance line will be built through this town.

WARWICK, N. Y.—The Warwick Telephone Company is rebuilding the telephone line between this village and Greenwood Lake. A new line will be put in to meet the Highland line at Hallock's, with a spur to the lake. The other construction is nearly all completed, so that this branch of the Warwick company's work will be through before winter.

HALIFAX, NOVA SCOTIA.—James A. Winfield, general manager of the Nova Scotia Telephone Company, is in Sydney, assisting the Eastern Telephone Company in transferring its wires to the new switchboard. This autumn the Nova Scotia company established its long-distance line to Antigonish. In the spring, at as early a date as possible, it will complete the line to the Straits of Canso, and the Eastern company will complete to Sydney, when a through service will be established between Halifax and Sydney.

EATON, O.—The local telephone company is building several new lines, including one to Cedar Springs. When the extensions contemplated are completed the exchange will have over 200 telephones connected.

ALLENTOWN, PA.—Connection has been secured between the Easton Telephone Company's line at Bethlehem and the Lehigh telephone line. The Easton company and its connections have 1,000 or more subscribers in Northampton County and Eastern New Jersey, and the Lehigh company has 1,800 telephones in Allentown and Carasauqua. In a month or two Philadelphia can be reached over their lines, and many other places are being connected.

FALLS CREEK, PA.—Dr. J. A. Haven, Dr. J. K. Brown, E. C. Robinson, Benjamin Keck and William Cox, members of the board of directors of the Summerville Telephone Company, were here recently for the purpose of deciding plans for extending the system to this place. After a full discussion of the matter it was decided to connect up Falls Creek subscribers with the Du Bois exchange, and not to establish an exchange at that place for the present.

GLEN CAMPBELL, PA.—The Indiana Telephone Company held a meeting recently at which a number of improvements on its lines were discussed. It was decided to put the entire system on a metallic circuit. The new trunk line to Johnstown has just been completed at a cost of \$2,000. This will give the company facilities for doing business with Johnstown, Somerset, Altoona and east for a great distance. A metallic circuit line from Saltsburg to Avonmore will shortly be installed, giving good connection with Apollo, Vandegrift and other points on the West Penn. Connections are being made with a farmers' telephone line at Creekside. This line covers eight townships in Indiana and Armstrong counties. These improvements are made necessary by the greatly increased business of the company, and will make the system very valuable to its customers.

PARSONS, PA.—The People's Telephone Company has received right of way through the borough and has established an exchange at Miners Mills for Plains, Hudson, Parsons, and other villages in this section.

PEN ARGYLE, PA.—Conrad Miller, of Nazareth, was here recently in reference to erecting an exchange building for the Slate Belt Telephone Company, of which Mr. Miller is president.

READING, PA.—The Consolidated Telephone Company has issued a list of 375 subscribers. It will be added to as connections are made with 600 additional telephones. The aerial cables, the absence of which caused some delay, have arrived and as fast as they are placed connections will be made. New subscribers are being secured daily.

SYLVANIA, PA.—The new telephone line from Sylvania to Elk Run has been completed.

WEST NEWTON, PA.—The West Newton town council, which recently entered suit against the Federal Telephone Company to collect the pole tax, is again after the company, and will endeavor to restrain it by injunction from stringing its wires on the poles until the tax referred to is paid. The telephone company has a force of linemen at work at West Newton getting ready to connect that place with McKeesport and towns throughout the Monongahela Valley.

GREENVILLE, S. C.—The Bell Telephone Company is building a line from Greenville to Anderson.

VALLEY SPRINGS, S. D.—The poles have been ordered for the new telephone line, and work will soon be commenced.

KNOXVILLE, TENN.—The People's Telephone Company is constructing a line to Lafollete and Jellico.

DENISON, TEX.—The new telephone line just constructed out of Woodville gives Denison direct connection with Isom Springs, Brownsville, Amon, Shay and Willis.

EDINBURG, VA.—A telephone line is being constructed from here via Readus and Lantz Mills to Calvary.

LEESBURG, VA.—A new telephone line is being constructed from Waterford to Leesburg.

EAST ROXBURY, VT.—The Corinth co-operative telephone line is sure to be run between this place and Brookfield.

MARTINSBURG, W. VA.—The United Telephone Company, of Philadelphia, will shortly commence the work of improving the entire line of its district No. 13, known as the Winchester Telephone Company. Mr. Murtrie, district superintendent, with headquarters in Hagerstown, was here recently measuring the town for cables. Most of the overhead wiring will be done away with, the cables going underground. All of the old wires will be taken down, and those that cannot be connected to the cable will be replaced with new wires. Everything in this district will be entirely new. Two new common battery switchboards have arrived for use in the exchange. All the old telephones will be replaced with new ones. The line to Winchester is to be completely overhauled, new wires will be put up, new and better connections made. Long-distance connections are also to be made in the near future with Baltimore and Philadelphia.

GLENWOOD, WIS.—Service on the new Glenwood telephone system will be begun soon. Work on the suburban lines to Downing, Bolceville, Emerald, Ceylon, New Richmond, the kaolin mines and Graytown, is now in progress, and it is expected that within sixty days the entire system will be completed.

KENOSHA, WIS.—The Bristol-Kenosha telephone line is now in operation, and it is possible for subscribers to the line in Kenosha to reach every part of the county by telephone. The opening of the line puts Kenosha in touch with nearly two hundred farm houses scattered all over this county and in the northern part of Illinois.

Underground

PUEBLO, COLO.—Work of putting the telephone wires in Pueblo underground has been commenced, and will be pushed to completion as rapidly as possible.

MUNCIE, IND.—The demand for telephones from the new Madison and Delaware Counties Telephone Company has been so great that several thousand feet of underground cable will be required other than that first contracted for.

AUSTIN, TEX.—The telegraph and telephone companies in Austin have decided to bury all telegraph and telephone wires in the event of permanent improvements are decided by the City Council.

Miscellaneous.

NEW BADEN, ILL.—A telephone exchange has been established by the Southern Union Telephone Company here.

BUNKER HILL, IND.—Wiles Bros., projectors and builders of the new local telephone line, are working on its construction, and will have it completed and ready for use by the middle of November.

EVANSVILLE, IND.—Mayor Covert says he does not know how much stock of the Municipal Telephone Company has been sold, but that he has personally disposed of \$50,000 worth. There are twenty other subscription papers out, but it is not known with what success. It is the intention of the Mayor to dispose of all the stock this winter and have everything in readiness to begin work on the plant early in the spring.

MUNCIE, IND.—The Delaware and Madison Counties Telephone Company has taken possession of its new exchange building, which was erected at a cost of \$24,000. The switchboard is now being installed, and will be completed by November 1.

THE WEEK'S MESSAGES Continued

NEW CASTLE, IND.—The New Castle Telephone Company is making arrangements for toll connections with surrounding cities.

RICHMOND, IND.—The Lynn and Fountain City telephone system will soon be completed. It will be quite extensive, including Spartanburg, Arba, Glen Karn and Modoc. Extensions will also reach Bethel, Whitewater, Cox's Mills and Williamsburg. The system will connect with the Richmond Home Telephone Company.

NORTHWOOD, IA.—The line between Northwood and Gordonsville is completed, the telephones are all installed, and the people along the line can talk with each other over the wires, but they are not connected with the local exchange. Switchboards for the rural lines and for the city exchange were ordered several weeks ago and prompt shipment was promised, but they have not been received. It is expected that they will arrive within a very short time and that the line can be put in working order. On the west line the poles are all set and part of the wire strung. The line will be extended southwest to Tenold and northwest to Silver Lake. It is probable that fully fifty farm homes will be supplied by the west line from the very start. The proposed line to Deer Creek is still hanging fire owing to a misunderstanding with the Lyle company.

MARYSVILLE, KAS.—The Interstate Telephone Company in this county is reaching out for new business. At present the only town in the county not reached by this company is Oketo, and negotiations are now on foot for a wire into that town. Besides this the Interstate company has connections with all the Independent rural lines throughout the county. Many repairs have been made over its lines in the past few weeks, and the service is now in first-class shape.

ELIZABETHTOWN, KY.—The deal which has been on for some time between the Home Telephone Company of Louisville and the Hardin County Telephone Company culminated recently in a twenty-year contract between the two companies. The contract provides that the Home company shall enter the Hardin County exchange in this city with its wires, that shall have access to all the lines of the Hardin County company in transmitting its messages free of charge, and that the Hardin County company shall have connection with all long-distance points over the Home wires at the regular schedule rates, 25 per cent of the same to go to the Hardin County company. The rate from Elizabethtown to Louisville over the Home lines will be 20 cents a message, with the privilege of five-minute talk, against 25 cents over Cumberland, with three-minute limit.

PONTIAC, MICH.—Connections have been made between the Alma Telephone Company and the local Independent exchange.

HANNIBAL, MO.—The board of directors of the Bluff City Telephone Company, which is to construct a \$70,000 telephone exchange here, held a meeting here recently. The work of erecting poles for the system has already been commenced.

JAMESTOWN, N. Y.—The Sherman telephone lines are now connected with Jamestown.

SALAMANCA, N. Y.—The Independent telephone line, which has been under construction for some time, has been connected with the Steamburg line. It now has connection with Randolph, Steamburg, Cattaraugus and Little Valley.

WASHINGTON, PA.—J. R. Throckmorton, of Waynesburg, who, in connection with his brother, E. B. Throckmorton, composes the Standard Telephone Exchange Company, is here for the purpose of making arrangements to connect with the Federal company, which already has an exchange here. The former company owns more than 1,000 miles of line, principally in Greene County, with about 500 telephones, and at present it is being constructed in a direct line to the Greene County capital from Washington. This will be easily accomplished, as, by establishing a main line to Lone Pine, the work will have been completed.

Personal

SOUTH CHARLESTON, O.—J. C. McMillan, manager of the South Charleston telephone office and secretary of the Madison-Clark Telephone Company, has resigned. The latter position has been filled by the election of A. S. Bell.

CADILLAC, MICH.—Fred Kooyers has been appointed manager of the Cadillac exchange, which was recently taken over by the Citizens' Telephone Company. Mr. Kooyers was formerly an inspector in the Grand Rapids office and had been in the employ of the company for five years, almost since it was first started. His appointment, therefore, comes as a promotion.

GENEVA, O.—J. C. Terwilliger has handed in his resignation as manager of the Madison Telephone Company, having exchanges at Geneva, Madison and Perry, which he accepted early last spring, coming here from Columbus.

BLOOMSBURG, PA.—W. H. Balsley, of Philadelphia, has been appointed manager for this district of the United Telephone and Telegraph Company.

AUSTIN, TEX.—Col. W. B. Wortham has been elected vice-president of the independent telephone company of this city by the stockholders and directors.

RESIGNATION OF STUYVESANT FISH.

THE announcement was made recently that Stuyvesant Fish had resigned from the directorate of the Western Union Telegraph Company. Several reasons were given for his withdrawal, one of which may be interesting to readers of the AMERICAN TELEPHONE JOURNAL.

Mr. Fish is president of the Illinois Central Railroad, which has nearly finished installing what is probably the most complete railway telephone system in the world. It is contemplated to entirely supercede the telegraph system by the telephone. Mr. Fish has been one of the most enthusiastic workers in behalf of the telephone. On this account, it is said, and believing that the entire telegraph service of the world is doomed, since the advent of the telephone, he has sold out his holdings in Western Union.

TRADE NOTES

THE ADAIR & RUSSELL TELEPHONE COMPANY has very much improved the service of its toll line by putting in new Stromberg-Carlson bridging telephones and repairing its line up in good shape.

THE CENTRAL TELEPHONE AND ELECTRIC COMPANY, St. Louis, Mo., has established a sales office in Chicago, Ill. This office is at No. 59 West Jackson Boulevard, and is in charge of Mr. C. E. White. He has a full line of samples and facilities for taking care of any orders in that locality to good advantage.

MR. G. M. GEST, the conduit contractor, of New York and Cincinnati, has been awarded the contract for all the underground conduit work to be installed by the Brooklyn Heights Railroad Company this season. This contract amounts to over \$25,000.

THE AMERICAN ELECTRIC TELEPHONE COMPANY, Chicago, has a new iron box traction or mine telephone set on the market. It is made with a front protecting plate which covers all of the working parts, leaving exposed when the outside door is open only the transmitter mouthpiece, receiver and generator crank. The protecting plate is fitted with a rubber gasket, making it dust proof. The telephone set is made up with ringer coils of various resistances as desired. These ringer coils either cut in all of the time or cut out when the outside door is closed, leaving the line perfectly clear.

One of the most prominent exhibits at the American Street Railway Association Convention at Detroit was that of **THE STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY**, of Chicago, Ill., and Rochester, N. Y. It had many types of telephones adapted to street railway service on exhibition and also a model type of switchboard, illustrating the different systems, such as central energy and magneto generator call. Telephones were connected to this board, and the company's representatives were frequently called on to give working exhibits by street railway representatives present.

A very neat little booklet has just been gotten out by the **KELLOGG SWITCHBOARD AND SUPPLY COMPANY**, Chicago. The title of this booklet is, "The Express, and Some of Its Stopping Places." It is printed on a rich cream paper in black and orange ink, and the cover is a light brown, with the title printed in black with an orange border, making a very striking and yet harmonious effect. The "express" refers to the small switchboard of from 50 to 500 lines capacity which the Kellogg Company makes. Its "stopping places" are 51 letters from as many telephone companies that have installed these express switchboards, all indorsing in unqualified language the superior qualities of the Kellogg apparatus. The booklet consists of 32 pages and cover, and is an effective piece of advertising literature.

THE CENTRAL TELEPHONE AND ELECTRIC COMPANY, St. Louis, Mo., has issued a little booklet illustrating the new battery call telephones for inter-communicating and hotel use which the company is now manufacturing. The Central Company makes a specialty of this class of instrument, and this booklet gives a complete

description of all their meritorious points and also a price list. This line of telephones is guaranteed by the company on the following points: Perfect mechanical and electrical construction, no cross-talk, plugs can be left in any jack without disturbing station so doing, and less battery required than other systems.

THE KELLOGG SWITCHBOARD AND SUPPLY COMPANY, Chicago, is sending out a circular letter and a card advertising its facilities for supplying cedar poles. The card is interesting in that it gives three tables. One of these tells the number of poles of stipulated sizes that can be loaded on single freight cars; another gives the same information for double cars, and the third gives the weight in pounds of poles of different sizes. On the reverse side of the card is a calendar for 1903. The Kellogg Company, on account of the big orders it gives the railroad companies, gets the very best facilities for shipping its orders, and at this time, when a car famine is on, this will enable it to give prompt shipments. It has on hand a lot of 6-inch 25-foot poles that will be sold at a bargain.

THE F. BISSELL COMPANY, wholesale dealers in electrical supplies and machinery, Toledo, O., has just moved into its new home. Some time ago the business of this firm increased to such an extent that more extensive quarters were an imperative necessity. It was decided after a careful canvass that better facilities would be secured by constructing an entirely new building instead of enlarging the old one or leasing additional quarters. Plans were accordingly drawn for a new structure that should embody features specially adapted for the requirements of the company and also afford commodious quarters. This building has just recently been finished, and the firm has now transferred its plant. The new building is four stories and basement, and each floor has an area 60 by 100 feet. Here an equipment has been installed that makes it the most complete and up-to-date electrical supply house in this country. Everything that would add to the efficiency of the handling and shipping of orders was carefully thought out. Many new features were adopted, being the creations of Mr. Bissell himself. The facilities of the Bissell Company now for attending to all orders is second to none in the United States.

THE STANDARD VITRIFIED CONDUIT COMPANY has closed a contract with the city of New Castle, Pa., for a complete municipal conduit system. This contract calls for about 300,000 feet of multiple duct, vitrified salt-glazed conduit of the very latest pattern manufactured by the Standard company. Mr. Robert W. Lyle, president of the company, has recently taken out several patents on lock keys for conduit section joints, which have been abstracted in the AMERICAN TELEPHONE JOURNAL. These lock keys are a distinctly radical departure in conduit construction. The New Castle system will be equipped exclusively with the new conduit embodying this feature, and will be the first installation using the device. The Standard company has orders booked ahead for about four months' supply of its factories, including systems for the following: Bell Telephone Company, Atlanta, Ga., and several other cities in the country; conduits for Baltimore, Md.; Mobile, Ala.; Richmond, Va.; Clarksville, Tenn.; Catskill, N. Y.; Worcester, Mass., and the Niagara Falls Power Company, Niagara Falls, N. Y. Messrs. Regan & Mullock, of Philadelphia, well-known conduit contractors, have the contract for laying the conduit system for the New Castle municipality.

THE ROONEY-WESTBURY ELECTRIC LAMP COMPANY, 154 E. 23d Street, New York, has been incorporated for the purpose of manufacturing miniature electric lamps of all kinds. Especial attention will be given to switchboard signal lamps, which will be made a specialty by the company. The company has excellent facilities for filling all orders, and its shipping department will be particularly efficient. In its announcement of organization the company states that orders for lamps carried in stock will be shipped at a day's notice; special lamps not in stock, at from three to ten days' notice. This feature is one that will appeal to all individuals or corporations, for prompt shipments of goods tends more to popularize a firm than any other detail. The officers of the company as organized are: John Rooney, president; W. H. Meadowcroft, vice-president; Harry Westbury, treasurer; Francis J. Rooney, secretary, and John J. Rooney,

E. E., second vice-president and general manager. The president of the company has been in the lamp business ever since the foundation of the industry, and knows every detail of construction. Mr. Westbury, the treasurer, was formerly with the General Electric Company in its miniature lamp department at Harrison, N. J. He also is an authority on miniature lamp construction.

PLANTS FOR SALE

Advertisements under this head \$1.00 for 25 words or less for each insertion. Prepaid.

FOR SALE—One of best equipped telephone exchanges in Kansas; price, \$22,000; upon which amount plant now NETS 23 per cent. If you mean business, address X for particulars, care of AMERICAN TELEPHONE JOURNAL, New York.

TELEPHONE PLANT FOR SALE—160 telephones, 100 miles of toll lines; excellent opportunity for extending business; will sell for \$12,000; pays 15 per cent. net on this amount. Address TELEPHONE CO., care of AMERICAN TELEPHONE JOURNAL.

WANTED

Advertisements under this head, 25 cents for 25 words or less for each insertion. Prepaid.

WANTED—A loan of \$1,000 on a telephone exchange of about 150 subscribers in a town of 2,400 inhabitants. Complete, with long-distance telephones, switchboards, cables, power generators, etc. Wish to extend toll lines. For particulars address B., care AMERICAN TELEPHONE JOURNAL, N. Y.

POSITION as assistant manager of exchange of 100 or 200 subscribers, or as inspector. Best of references furnished. Address T. C. B., care AMERICAN TELEPHONE JOURNAL.

POSITION as superintendent or manager in telephone system, either on line or in exchange, by a young man of strictly temperate habits. Best of references as to character and ability. BOX 145, care AMERICAN TELEPHONE JOURNAL.

POSITION as wire chief in central energy exchange of from one to two thousand subscribers; 9 years' experience; best of references. A. B., care AMERICAN TELEPHONE JOURNAL, New York.

A HOME IN SOUTHERN CALIFORNIA—I desire to communicate with a man capable of taking charge of a factory for insulating rubber-covered National Code wires. This is a splendid opportunity for the right man. References given and required. No money necessary. Address P. O. BOX 1116, Los Angeles, Cal.

POSITIONS as linemen by two experienced workmen. Would prefer construction work in Michigan or nearby State. Address R. M. M., care AMERICAN TELEPHONE JOURNAL, New York.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISSELL CO., Toledo, Ohio.

POSITION as foreman or superintendent with telephone or construction company. Twelve years' experience in telephone construction work; best references furnished. Address J. W. S., care AMERICAN TELEPHONE JOURNAL, N. Y.

POSITION in an exchange of 100 to 500 subscribers, as manager or assistant manager. Experienced in construction and switchboard work; references furnished. Address EVAN PAUL JONES, North Vernon, Ind.

EXCLUSIVE handling of an account, for Chicago trade, beginning January 1st. Manufacturers Agency basis. Address SALESMAN, care AMERICAN TELEPHONE JOURNAL, Monadnock Building, Chicago.

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RATES—UNIFORM, REASONABLE AND PRACTICAL*

By D. L. PENDLETON

IT might be considered dangerously impractical to put a member of the legal fraternity down for a talk on rates, his ideas being professionally tuned to a higher pitch by the practice where the smaller coin have no standing on the rate-sheet and the fees are made out in round numbers; but we will endeavor to be practical. As one of our bank cashiers said of the telephone rates and collections the other day, "It looks like a nickel business." He was then turning out twenty-dollar bills with each clip of his shears. He was right in that, but failed to see that therein lay its virtue and the secret of its success, as were the tiny hairs of the mighty Sampson's head. It is essentially a business of low rates and small collections—so it is with the street railway, or, better still, with Uncle Sam's postal service.

While in a discussion of the rate question in detail, the exchange and toll service must be treated separately; still the general underlying principles of the telephone business apply with equal force to both alike, and for this reason and for the purpose of taking a broader and more comprehensive view of the subject we shall consider only those leading and controlling principles which must govern in fixing a successful scale of rates, leaving for time and experience the working out of the finer practical details along the lines suggested.

Before all else, there must be a fixed and rigid uniformity in rates, which is as important and essential in the local exchange as in the long distance toll lines. Next to this should be considered the reasonableness of the rate to be fixed; and, lastly, but not the least interesting or profitable, should come the time of payment and collection. Strict analysis of the subject, carrying it out into the minutest branches, giving each particular twig its proper setting on its respective branch, and each individual branch its true connection with its spreading limb, and each limb its junction point with the trunk, is well enough for the class room or text book, but is too skeleton-like for an occasion like this; so I shall endeavor to bring all that I have to say within the bounds of at least one of these three heads.

I.

UNIFORM RATES.

The subject of uniformity should be of peculiar interest to this association, for it was the feeling of its pre-eminent importance that first brought this organization into being; and now the work of this association is to bring about the object of its creation—a general and absolutely impartial and indiscriminating uniformity of purpose, of operation and of maintenance throughout all of its members. If it fails in this, it has failed utterly.

The connection of the telephone with the general public is as vital as speech itself is to man. It is the vocal organ of trade, the mouthpiece of business, and, as the confusion of tongues put an end to all business at Babel, so any confusion, any lack of perfect harmony either in telephone service or rates, will be sure to produce a discord that will jar on the public nerves and to a certain extent disturb, if not prevent, the smooth and even tone of trade. The American is fast reducing the transaction of all business to a science. Everything must contribute to the free and unrestricted play of this marvelous game of business; and the one thing that the American business man must know and never forgets is the price. This, he demands, shall be uniform; and he is but an exponent of the power of this law of commerce. Every operation that has to do with the transaction of business must come under the power of and be ruled by this law. Anything that produces friction is to be avoided, or cast off, or overcome, for in this case it is not the poetic friction caused by the grain

of sand in the oyster's shell, which out of its tears produces the priceless pearl; but the practical, business-like, every-day friction of a dry axle which makes the hot-box, with its accompanying smell and smoke and resulting delay and vexation. It is better for rates to be too high than not uniform. The railroads have been brought under this rule; street car lines have recognized it for years; the postal service is perfect in its uniformity. But before the secret was discovered numbers of railroad companies lost their bearings and went to pieces on this reef. They failed, not because their rates were too low, but from cutting rates, in competition, discriminations and a fatal disregard of the laws of business. Many of these companies have passed into receivers' hands with five-cent mileage rate-sheets in use, fixing exorbitant rates for A and cutting to the point of absolute loss for B, till, in many instances, the sovereign authority of the State has had to step in and declare against discrimination and for uniform rates.

In the exchange, the city or town service must be carefully classified, fixing in its locality the proper charges for business houses, for offices and for dwellings; and in the country service the same rule should apply. The most just and equitable rate for country service is a fixed charge per mile of wire, as wire rent, in addition to the box rent charged for like service in the town where the exchange is located. For example, our box rent in town for residences is \$12 per annum, and for country service each subscriber pays, in addition to this box rent, \$2.50 per mile a year for a single wire, measured along the nearest traveled highway from the city limits to the subscriber's residence. This wire rent is apportioned among the number of subscribers that may be on a single wire. In Fayette county they have a flat rate of \$18 per year for such service, with the privilege of putting as many as eight subscribers on the same line. This does not seem as equitable, for the reason that the man only one-half mile from town pays the same price that the man four miles farther out pays for his service. But both of these methods of rating, so far, have given satisfaction in the territories in which the respective companies are operating, because they are uniform and reasonable. Still we do not believe that this will always satisfy the public. The rate should be the same for like service all over this State at least.

Besides the unavoidable friction that any lack of uniformity in rates must cause, there is also generated an undercurrent of talk and comment, which swells at length from comment to criticism, and finally from criticism to chronic objections and open hostility. The public chafe under these petty annoyances, and, being in a quasi public business, the public at least must be satisfied. In some of our cities the subscriber is given a limited service, either paying so much for each message or a certain price per day, week or month, for the privilege of a limited number of conversations each day. And undoubtedly this method is growing in popularity—but with the telephone companies, and not with the public. It is argued that this is a good thing, giving just as much service as the subscriber is willing to pay for; but it has not been thoroughly tested, and it seems open to the objection that it creates too much friction, too many annoyances to the subscriber in the daily use of his telephone, and in the irregular charges and collections.

The party line system, which is in use in many cities, we believe, is open to the same objection—it disturbs the uniformity of rates as well as the service, and must eventually be abandoned.

In long distance work this rule still holds, and with greater force and point. It is hard to convince the people that the rate from Cincinnati to Louisville should be less than from Louisville to Cincinnati—though we have a surveyor in our county who did testify in court that it was farther, by actual measurement, from

*Paper read at Convention of Kentucky Association, Louisville, Oct. 28.

the bars on the hill to the stump by the branch than it was from that same stump back to those identical bars on the hill.

It is needless to illustrate the point further, but there is one evil that should be guarded against, a fatal example set us by the old line Bell companies, that comes properly under this head. That is, cutting rates! It is on a par with carrying concealed weapons; it is the cause of nine-tenths of the failures in our telephone business. Like the concealed weapon, it is not employed for legitimate purposes and oftener entails misery on those who rely upon it than on those who are the intended victims. Never cut your rates except to bring them nearer to a more uniform or reasonable basis, and even then look well to the future, and first be sure that you can afford to continue them at the lower rate for an indefinite time. It is infinitely wiser to hold at the same scale than to make a cut for a season and then attempt to return to the original price. Your cut rate is a two-edged sword; the revenue is thereby reduced directly and the expense correspondingly increased, because the cut in price brings a larger business, and this, in the telephone world, is now acknowledged to mean a disproportionate increase in expense, besides the first cost of installation. Few battles have been won by cutting rates in any business, and especially in our business, though the odds have been fearfully against the Independent companies.

Speaking on this subject, I am reminded of the objection that was raised in Memphis not long since by one of her citizens to the fact that the Cumberland Telephone and Telegraph Company was giving away free service to many subscribers in that city, but was charging and collecting from the old subscribers the regular rate, and especially am I reminded of the published response to this objection given by Mr. Caldwell, which was in substance that his company had seen fit to adopt this method of advertising its business, and it was their business and no one had a right to object; that it was, in fact, adding to the value of the service for which those objecting had contracted to pay a certain price, giving these old subscribers a larger list reached by the company, and hence a greater value received for their money. This sounds plausible, but don't you know it did not at all satisfy the people.

A few of our States have put their stamp of disapproval on such discrimination, and it will not be many years before all the States adopt similar legislation.

In order to best accomplish this uniformity of rates in long distance service, it will be necessary to form an auditing committee or clearing house. This should be a committee of or under the supervision and control of this association. It can be formed by mutual contract between the various companies outside of this organization, but the wiser method is to keep everything of this nature in the association—in such unity is strength. Whether the time is ripe for such a committee or not is for the companies themselves to decide. We further suggest that this same committee, or whatever it may be styled, have supervision over the exchange and local toll rates, as well as the long distance work, so that a general uniformity of rates and modes of operation may be more nearly approached, if not reached, all over this State. There are two potent reasons why this auditing committee, or bureau, or clearing house, should be kept as a part of this association—first, because it gives force and vitality to this organization, and, second, the association, being formed by all the companies as a representative body, has a wider and more binding influence and authority in all dealings with its members.

Neither time nor space is here given to lay out the working plans for this committee, or to draw up the specifications for its work in detail. In all toll lines one mode of measurement, one rate per mile, one limit of time for each conversation, should prevail throughout this State; then it will be for the State associations through interstate or national organizations to extend uniform system over the interstate service.

The railroad companies have arrived at this uniformity after years of struggles, of cutting rates and of failures, and even now they are to a great extent held in line by the railroad commission acts of the various States and by the interstate commerce commission of the National Government. Would it not have been wiser for these companies to have long ago voluntarily met and organized in a business-like way so as to control, regulate and direct the operation and management of the roads throughout our country? Shall we not profit by their experience?

II.

REASONABLE RATES.

A reasonable rate for telephone service might be said to be one that requires the public to pay a fair and just price for the

service rendered, and which allows the company a moderate profit on the business; but the inexperienced should be cautioned and wisely advised as to the correct method of arriving at this reasonable rate. With the average business, a month of experience may serve to give a fair idea of what per cent. of advance on the buying price will return a fair profit, because if trade increased, as usually is expected, the per cent. of advance charged for the wares returns a larger profit proportionally. Not so with the telephone, however. You cannot, like the guileless Israelite, sell below cost, and, as he explained, make money because you sell so much.

The inexperienced telephone man does a deal of harm by rushing in with philanthropic enthusiasm and fixing a rate that will barely earn him a living, when it is a fact learned from sad experience that each telephone added to his list nibbles at that profit until, if he prospers in extension, he inevitably fails in his business, or, catching at a straw, he attempts to raise his price and instead raises a general public kick. Short-sighted enthusiasm, doing business for his health only, his aim is high, but his judgment of a very low order.

This phenomenon in the telephone business, that an increase in business always produces a disproportionately larger advance in the expense of operation and maintenance, is not known in any other business. So strange is it and so contrary to all business experiences in other lines, that the public generally are still skeptical; but, nevertheless, it is a fatal fact, and the telephone man cannot afford for a moment to forget or disregard it. This is especially true in the operation of an exchange, and can be explained in part by the fact that an exchange is built on the plan of a wheel, with the switchboard as the hub, and it is plain to see that the first foot of extension from the centre does not cover the same area as the second or third foot will include, while the price for each foot must be the same within the limits of the exchange service. This peculiarity does not obtain to the same degree in the toll service, if at all, and for this reason we suggest that toll rates should be made as attractive to the public as can be afforded, letting the basis of these rates be the air line distance between the originating and terminal points, fixing a rate per mile, which may be scaled for each ten or hundred miles covered. But the service should never be cheapened in order to allow lower rates; this is a ruinous policy, and no circumstances can justify it. The telephone is daily improving and the business advancing with steady steps, and every energy must be directed to keeping in the ranks—one step back is two steps lost.

III.

PRACTICAL RATES.

We must always lean to the practical in every detail in this business, and all interest in the business must finally centre in the collections, in the revenue to be derived from our operations. We are in a position to do a strictly cash business, and this must be maintained at all costs. In fixing the rates, it is well to keep in view the time and manner of making the collections. In operating an exchange it is obvious that the farther in advance the collection can be made, the safer and more profitable is the business. Collections made quarterly in advance are two months better than monthly in advance, in the actual saving accomplished, to say nothing of the additional expense and trouble in making the twelve rounds each year instead of four. The monthly collection is to be avoided; it becomes an annoyance, the chances of loss are too largely increased, the leakage, shrinkage and "ratage" is greater, and the profit correspondingly smaller.

Some companies have given rates to their exchange subscribers that allow them the unrestricted use of local toll lines operated in connection with other companies, choosing for the sake of convenience to make the collections of their toll service thus simpler. This is very damaging to the toll service and manifestly unfair to the connecting company, and should be discontinued before it becomes more general; for it can only prove a most prolific source of discord both between the public and the telephone companies and between the companies themselves.

I am aware that the ideas that I have attempted to suggest are general in their nature and doubtless rough in outline, but I would assure you that this does not come from any lack of special and positive interest in the work of this association or of the telephone business, but from lack of ability to do the subject fuller justice. But there is one phase of this rate question that I have not mentioned—the rate of speed at which the Independent movement is traveling to-day—may it never diminish.

FINANCES FROM AN ALABAMA STANDPOINT

By W. H. BYRANT

THE Home Telephone Company, of Mobile, Ala., was organized early in 1895, and was one of the first, if not the first, large Independent exchange. Its stockholders consist of the best and most progressive business men of Mobile, and its career has been most eventful and severe. At the time the company was formed a committee of citizens waited on the representatives of the Bell Telephone Company and asked that its service be improved and the price lowered from \$60 to \$45 per year. The Bell Company listened to their petition, but paid no further attention to it. The citizens then threatened to build an exchange unless their demands were acceded to. The Bell representatives told them to go ahead and build; that they would remain in the telephone business anyhow.

The Bell Telephone Company was operating at that time 329 subscribers, and its rates were \$60 per year for business and \$50 per year for residence telephones within a half mile radius of the exchange, and \$5 per year additional for each quarter of a mile of wire beyond. This was payable annually in advance; if paid quarterly in advance, an additional charge of \$4 per year was made.

The citizens solicited subscribers to a new telephone exchange on three-year contracts at the rate of \$30 per year for business and \$25 per year for residence telephones, and succeeded in getting about 400 signatures.

The man whom the directors selected to take charge of the work of building the exchange had had no previous experience in the telephone business, and, as in many other cases, the stockholders have suffered thereby. This man estimated that the exchange could be built complete and ready for operation for less than \$20,000. The company therefore incorporated and issued fully paid-up capital stock for that amount. After that was used up, it found that the exchange could not be built for that amount, so it issued 8 per cent. five-year bonds. After exhausting this and the exchange far from being completed, the company borrowed \$15,000 on its note, bearing 8 per cent. interest, and also used part of the earnings of the exchange for the first year to finish up the construction. Thus the \$20,000 investment had developed into an investment of over \$55,000, \$15,000 of which was a note; thus the company faced a fixed interest charge of \$2,800 per year.

The company obtained for all this money very poor value indeed—a central energy switchboard of abominable construction, with a capacity of 800 subscribers and multiplied at every operator's position. The current for operating this board was obtained from the Fuller type of primary battery. The pole lines were built for 500 subscribers. The poles consisted mainly of cypress, cut green and put up immediately, some of them sprouting after being set. These poles were then painted before they had time to season, and, needless to say, they have long since rotted down. The wire was No. 14 galvanized iron, with short lead-covered cables leading into the exchange. The instruments were a freak, consisting of a hand microphone, with 10 feet of flexible cord that was fitted to wind up on a reel contained in each bell box. The troubles with the switch-board were too numerous to mention here.

With this unpromising start, the Home Telephone Company had many obstacles to overcome, and the wonder is how it is

to-day in existence with nearly 600 subscribers and giving very satisfactory service.

Immediately that the exchange was opened for business, the Bell Company cut its rates to \$1.67 per month for business and \$1 per month for residence telephones anywhere within the limits of the city. It put its best canvassers in the field, who made a house to house canvass. The service of the Home Company being so poor that the telephones could be used but rarely, the Bell Company succeeded in getting about 700 subscribers, consisting mainly of the \$1 per month telephones. It maintained this rate for two years. In the meantime the service of the Home Company became worse and worse. When the three-year contracts of the Home Company were nearly up the Bell Company, anticipating an early death to the Home Company, raised its rates 50 per cent., charging \$2.50 per month for business and \$1.50 per month for residence telephones. During this time the Bell Telephone Company, or rather its manufacturing branch, the Western Electric Company, had sued the Home Company for infringements of Scribner's improvements in multiple switchboards, which suit was decided against the Home Company after a hard and expensive fight.

Instead of the Home Company dying, as anticipated, it took a new lease of life. It changed its switchboard to come within the scope of the decision of the Federal Court. When about ready to switch over, the Bell Company notified the Home Company that it had obtained a decision in California sustaining the Farnham patents, covering multiple switchboards of all kinds, and threatened an injunction unless we destroyed our multiple board. We asked for sixty days' time to do this, agreeing at the end of that time to have destroyed the multiple board. We then designed a transfer board for our system and altered the old board so that when the Western Electric Company sent to inspect it its representative declared that there was no infringement on any of its patents.

Just about this time we had a fire that completely destroyed our terminal room and cable terminals. We at once made repairs, put in chloride accumulators in place of the primary batteries, equipped the exchange with new telephones, the best on the market, and almost rebuilt the central office. We are now preparing to put in the latest improved central energy lamp signal, double supervisory switchboard, and we have underground ducts in the first paving district.

The Home Company, after being in operation for seven years, meeting with all the obstacles above enumerated, has never defaulted in its interest, has paid back the \$15,000 borrowed, has retired its 8 per cent. bonds with a new issue of ten-year 6 per cent. bonds, and has a plant that originally cost \$56,000 and is worth more to-day than when built. It has only the stock liability of \$20,000 and bond liability of \$20,000. And while it is true that the Home Company has never paid a dividend, it takes no financier to see that it has made big profits; and had it been capitalized correctly and built intelligently it would have been paying handsome dividends from the start. The rates have always remained the same—\$30 per year for business and \$25 per year for residence telephones—demonstrating beyond a doubt that the Bell Telephone Company had for years been robbing the people by its exorbitant rate of \$60.

FOREIGN CURRENTS

AN interesting contribution to telephone literature has been made by Mr. J. E. Kingsbury in a paper on "The Future of the Telephone in the United Kingdom," read by the author before the recent meeting of the British Association for the Advancement of Science, at Belfast. In the main, Mr. Kingsbury's paper is an argument against competition in telephony, but it is distinguished from other contributions to the telephone controversy that has raged so acrimoniously in Great Britain during the last few years in being couched in the most temperate even gentle language. This feature of Mr. Kingsbury's discussion of the telephone question appeals so strongly to our contemporary, the *Electrical Times*, a staunch supporter of municipal telephony,

that it considers the paper positively "statesmanlike." If it is statesmanlike to have extended experience and a thorough knowledge of the subject in hand and to discuss it on the broadest lines in a thoroughly impartial manner, Mr. Kingsbury's paper certainly deserves the qualification.

* * *

Mr. Kingsbury has been in the telephone business practically since its beginning in England, was a subscriber to the first telephone system started in London, and has been a subscriber to every system that has since been started, so his experience is not to be questioned. He is not a believer in telephone competition, and rehearses the well-known arguments of those who hold that

the telephone is a natural monopoly, to the effect that two rival telephone systems in the same town render the telephone service more inconvenient and more costly on the whole to the majority of users than one system alone. In support of this contention, Mr. Kingsbury cites numerous instances of competing systems in Great Britain and other parts of Europe, which, after a period of active competition, were amalgamated into single systems, to the benefit of the users of the service both as regards cost and convenience. Had Mr. Kingsbury's investigations on this point extended to this country, he might have found hundreds of instances of competitive telephone systems where amalgamation has not been contemplated.

* * *

Some remarks of Mr. Kingsbury on working expenses and depreciation are worth quoting in full. "I wish to correct an impression that is very natural to the mercantile mind. It is that on the fixed subscription plan every additional subscriber is a monetary gain. A new subscriber adds to the working expenses in that he not only makes calls himself, but increases the calls of other subscribers. With the growth of the exchange, there is an increase in the apparatus or plant used in common, such as junction wires and switchboards, as well as in the number of operators. Hence, with the same class of equipment, the increase in subscribers leads to a disproportionate increase in cost of plant and working expenses. The reason why the working costs at the present time are not considerably higher than in earlier years is because the class of equipment is not the same. Improved appliances have been introduced, additional plant has been erected or old plant reorganized, enabling the work to be done more economically. But these improvements have cost money, and it will at once be seen that upon these early exchanges, which are so often referred to, further expenditures would need to have been made without an increase in revenue, and from this may be seen the importance of making an allowance for depreciation before arriving at the cost of the service. Depreciation in telephone plant must not be confounded simply with the wear and tear of ordinary machinery. Certain portions may be claimed to be practically indestructible in themselves and yet require considerable depreciation allowance. This arises from changes caused by growth whereby plant is displaced even though capable of continued youth. No rule can be laid down for universal application. There are instances of 5 per cent. and of 15 per cent. being allowed, but the medium figure (presumably meaning 10 per cent.) is more general."

* * *

All this is very sensible and well put, and may be profitably reflected upon by those who too rashly claim that unlimited telephone service may be furnished for unreasonably low rates and that a telephone plant is next door to being immune from the depreciation charges that all other mechanical plant must support. Mr. Kingsbury next goes on to argue against municipal competitive telephony, where we can hardly follow him, as the conditions governing the telephone business in the United Kingdom are so entirely different from those that obtain in the United States that this part of the discussion would have little interest for American readers. Mr. Kingsbury, however, makes one or two very effective points against municipal telephony in general. For instance: "The first idea that occurs to one is that the municipality is the local authority, and yet as applied to a telephone area a municipality is only one of several authorities, for whilst the business centres throughout the Kingdom have grown, the municipalities remain to a very large extent simply extensions of the old parochial system, and the extensions have not been carried far enough. The telephone area is the whole district over which the business and social relations of the locality naturally flow, but in their flow they cover numerous ownerships. There is no rivalry equal to the rivalry of neighboring municipalities; there is not a common interest, and, in the absence of identical interests, there is a difficulty in obtaining agreement in policy or on the details of carrying out a policy."

* * *

"Agreement may sometimes be obtained as the result of an enthusiasm against what is regarded, rightly or wrongly, as a common foe; it may be continued while the contest lasts. Assume that the ruin of the opposition is completed, will the cohesion continue? Localities change their condition. The fashionable quarter of to-day is the business quarter of to-morrow. It is the interest of the outlying district to develop its resources. It is the interest of the older and larger municipality—the predominant

partner in the telephone area—to retain its prestige, to prevent the development of its rivals. The telephone will be an important factor in such rivalries. Unless it be in independent hands it is easy to foresee a splitting up into smaller units, adding to the confusion, increasing the cost, and generally working to the detriment of the service."

* * *

Municipal telephony has not yet become a live issue in this country, and probably never will; but it has its advocates and supporters, who are very fond of making random and inaccurate statements regarding the success of municipal telephony on the other side, and may some day succeed in working up an active movement in favor of municipal telephones in the United States. To those to whom it may fall to combat such a movement, Mr. Kingsbury's arguments may prove very useful, while they put very forcibly certain conditions of the telephone business that it is worth every telephone man's while to keep in mind. He continues: "The successful supply of electric light, for example, by municipalities must not be regarded as any criterion of a similar result in the case of telephone exchanges. An electric light station contains a producing plant, the streets carry distributing mains, the service is from the centre outwards, and the entire plant from centre to extremities is under one control. A policy may be initiated and enforced without regard to outside considerations. Telephone exchange service, on the other hand, requires that the system should work in with other systems. Traffic between two places calls for provision for outgoing calls at one exchange and provision for incoming calls at another exchange. Independent views at either exchange are incompatible with successful working. Neighboring municipalities running tramway services might so arrange that there should be no through communication, but the inconvenience occasioned to the passenger would be only that of stepping out of one car into another. The equivalent in telephone service would be the stoppage of communication altogether."

* * *

The conclusion of Mr. Kingsbury's highly interesting paper is a forecast of the future that is by no means cheerful reading for believers in municipal telephony. He thinks it extremely doubtful that competitive systems will continue even to the end of the licenses granted them by the Postmaster-General. He suggests that telephone competition by municipalities was provided under a misapprehension of the nature of telephone exchange service, and a misconception of the results, direct or indirect, which might be expected. He thinks that those municipalities which have embarked in the telephone business have been mistaken as to probable benefits and actual cost, and that the results will be the same as those of previous competitions, viz.: amalgamation. "Duality will give way to unity as the only reasonable method of conducting the work. Unfortunately, disadvantages must be apparent and realized before they are regarded, and probably much expenditure will be incurred before the mistake is recognized. In the meantime the future progress in the practical use of the most beautiful and most useful application of science which the past century produced will be seriously impeded."

* * *

That last sentence has a peculiarly sad note, but fortunately the British public must by this time be used to the serious impediments offered to the progress of the telephone in Great Britain, for, as an example of inaptitude, vacillation and utter lack of courage or common sense, the policy of the British Government towards the telephone is unapproached in the history of any industry. From first to last the telephone has been harried and crippled by one government official after another, until a condition of affairs has been produced which gives satisfaction to nobody and "seriously impedes" the development of a great public utility—of a utility which has become a positive necessity to a modern commercial community. Americans may well be thankful that the Federal Government has never yielded to any movement aimed at establishing a Federal monopoly in telegraphs and telephones, for red tape is of the same inelastic nature in all countries, and there is no knowing what might have happened to the telephone in its own home had it been under government control. Certainly there would not have been the unparalleled development we are taking part in to-day, which is so largely due to a free and independent competition of a very different character from that which Mr. Kingsbury so eloquently deplores.

The Arrester.

PROGRESS AND DEVELOPMENT OF INDEPENDENT TELEPHONY IN TEXAS

By D. C. LINGO

THE progress and development of independent telephony in this State are, directly and indirectly, influenced by conditions that exist in no other State or Territory. The area of Texas is greater than that of three States combined; the principal cities are far apart. This places the telephone centres at such a distance from each other that the cost of connections between these points necessarily demands a great outlay of capital. It has only been within the past six months that the cities in the southern part of the State have been connected by Independent toll lines.

The majority of small exchanges being Bell leases, the intermediate points between large cities cannot be depended upon for any great amount of toll business. The Independent toll lines have started from the southeastern part of the State and have been extended north and west. Slowly the small exchange owners along these lines have seen where it is to their advantage to cut loose from the Southwestern Bell and rented apparatus and become identified with the Independent system, that in a few years will connect with every small village.

The systems in Texas have as yet no connections with the surrounding States, the conditions in these States being similar to those now existing here, and until there are better facilities for long distance conversation to the commercial centres of the North and East the toll business will not become the prime factor with the Independents that it is with the Bell to-day. Slowly and surely the small Independent companies are growing and reaching out and connecting with each other. The demand for apparatus of standard manufacture is increasing; the country lines are no longer built on two by fours, but constructed with the view of future development and improvement.

A factor that demands no small consideration is the amount of territory in the western portions of the State that are covered with barb-wire fence lines. When it is considered that many ranches comprise thousands of acres in extent and are many miles from any local exchange, it is readily seen how the fence lines that are so loudly condemned in other States furnish means of communication for a large class of people that have heretofore led an isolated existence. These fences are given good attention and care; the atmosphere and weather facilitates the use of the lines, and it is only for a few months in the year that the posts become damp enough to render ringing over the lines difficult.

Dallas is the only city in the State where the Independents have not been able to secure a foothold. Fort Worth is at present being worked by the solicitors of the Independent company that is going in at that place. Paris is in the course of construction, and Cleburne is being promoted by enterprising business men.

A deplorable fact in this State is that the managers and men identified with the Independent movement have no association. They attempted two years ago to promote an association of this kind, but there was but one man who paid his dues. The expense of the attempt rested upon the men who tried to get the association on its feet, and since then no movement has been made by anyone in the field to reorganize the association.

Texas is the coming State in the Southwest, and as the telephone movement is yet in its infancy there are great opportunities for capital and labor in this field. Considering the resources of the State, the cotton, cattle, oil and lumber, the rapidly increasing population and the facilities for growth, the progress and development of the Independent telephone movement has no better future before it than in the Lone Star State.

CONTEMPORARY CROSS-TALK.

CONTINUING the analysis of the operation of a telephone message which we started in our last discussion, we have to consider also the operation of a trunked connection. Our first analysis dealt only with a connection completed at the same switchboard at which the call originated, but in a large system, where the area served is divided up into districts each with its central office, all the central offices being connected together by trunk lines, there will be more messages requiring work at two central offices to complete them than there will be messages that are local to one exchange district. The examination of a trunked connection is therefore very important, because in a large system trunked messages will form much the greater proportion of the traffic. Further, an analysis of the operating of the trunked message is valuable because here a larger part of the operating is done exclusively by the telephone operator, and also because the working of local trunk lines in large telephone systems provides a standard of comparison by which the carrying capacity of local telephone lines may be gauged.

* * *

In order to have the complete operation of a trunked connection before us we will start afresh at the subscriber's call, in spite of the partial repetition that this makes of the analysis of the single exchange connection made in our last talk. A little repetition, however, is better than lack of clearness, and lack of clearness is the last thing one wants in discussing telephone problems. The steps in a trunked telephone message are as follows:

- (a) Calling subscriber lifts receiver from hook and line signal glows simultaneously.
- (b) Answering operator plugs into answering-jack, turns listening key and answers.
- (c) Calling subscriber gives number wanted.
- (d) Answering operator repeats back the number.
- (e) Answering operator presses call-wire button and gives number to trunk operator at distant exchange.
- (f) Trunk operator assigns trunk and.
- (g) Tests line wanted.

(h) Answering operator plugs connecting cord into jack of trunk line assigned by trunk operator.

(i) Trunk operator plugs assigned trunk

(a) into "busy-back" jack, or

(b) into jack of line wanted.

(j¹) Answering operator tells calling subscriber "busy," or

(j²) Trunk operator rings on line of called subscriber.

(k) Called subscriber answers, extinguishing supervisory lamp.

(l) Both subscribers, having finished their conversation, hang up their receivers, the supervisory lamps glowing simultaneously.

(m) Answering operator disconnects both cords, the disconnection of the connecting cord from the trunk jack causing the disconnect signal governing the distant end of the trunk line to glow simultaneously.

(n) Trunk operator disconnects trunk line from jack of called subscriber.

* * *

From the above analysis it will be seen that there are several more steps in operating a trunked connection than in operating a connection that is completed at the one switchboard, and that all these additional steps belong exclusively to the telephone operators, the work of the subscribers being exactly the same in both cases. It is clear that the operation of a trunked connection is considerably more onerous than that of a connection completed at a single board, as not only has the answering operator more to do, but a second operator is brought in and several steps in the complete operation of the message depend entirely upon her. Having enumerated the different steps that have to be undertaken by the subscriber and operators in the complete operation of a telephone message, it now becomes necessary, if we are to carry out our purpose of thoroughly investigating the time element of a local telephone message, to give a value in time to each of the steps and observe the effect, from the minute-mile point of view, of a gain or a loss in the time consumed in carrying out the various steps involved in operating the complete message. This promises to be a highly interesting process.

As we are discussing general principles and not comparing the operating efficiency of different actual systems, it will suffice for our purpose if we adopt purely arbitrary figures for the work on the two different classes of connections and for the time occupied by each step. There will doubtless be managers and superintendents who will claim higher operating efficiency than that indicated by the figures we shall adopt. If they can substantiate their claims, so much the better for them. There will be no quarrel between us on that score, and, as we shall presently show, the value of a few seconds gained, or even of a single second gained, in the operation of the average message is so great and so far-reaching that there can be nothing but compliments and congratulations for him who manages to clip the seconds off. In order to have a basis to work on, let us say that the actual operation of a connection completed at one switchboard occupies twenty-five seconds, and that of a connection passing through two switchboards occupies thirty-five seconds. The extra period of ten seconds on the trunk connection covers the several extra steps that are required when a connection has to pass through two exchanges, and is a fair allowance for the increased amount of work involved.

In analysing the time of operating a telephone message it is, of course, the average message that we are considering, not the quickest work that can be done under the most favorable conditions, when the flow of traffic is small, nor yet the abnormally slow connections that sometimes occur through delays caused by errors, accidents or slack work on the part of operator or subscriber. The average, or general mean of the whole day's work is what tells and is what the subscriber really gets, and where the work is made up, as telephone work necessarily is, of such an infinity of details, it is the average operation that must be the gauge of efficiency. In making up our twenty-five seconds for the total operation of the local call we may apportion the time to the different steps as follows:

From (a) to (b), that is, from the moment the subscriber lifts his receiver from the hook to the moment the operator's voice appears on the line, three seconds. From (c) to (d), where the subscriber gives the number wanted and the operator repeats it back to make sure that she has heard it right, three seconds. From (e) to (f), where the operator tests the line and finding it free, plugs in and rings, four seconds. So far, ten seconds, and as far as the part of making the connection entirely or almost entirely dependent on the work of the operator is concerned, the connection is completely established.

* * *

Now comes the long step from (f) to (g) which is entirely dependent on the subscriber. This is a difficult step to give a value to, and it is one that will vary considerably in different communities. For our present purpose we will adopt twelve seconds, which brings the total time of the connection, from the moment the first subscriber calls to the moment that the second subscriber answers, to twenty-two seconds. From (g) to (h) is the actual conversation, and with this at present we have nothing to do; if the subscribers are properly expert, and nothing out of the way happens, the operator has no further concern with the connection until point (h) is reached, and for the final step (h) to (i), when the operator, getting both supervisory lamps, takes down the two cords we will allow three seconds. On the trunk connection, step (d) to (e) becomes more complicated since the answering operator, instead of simply testing a multiple jack in front of her has to go in on a call wire and repeat the number wanted to the distant trunk operator; this, and the next step where the trunk operator assigns the trunk to be used are extra operations, and in allowing eight seconds for the extra work on the trunk connection, from point (d) where the answering operator has checked the number to point (i) where the trunk operator plugs the trunk into the jack of the line wanted, and so completes the connection, we shall be making a fair allowance for the extra work involved. The completion of a trunk connection then, as far as the work to be done in the two central offices is concerned, occupies eighteen seconds. The step from (j) to (k) the subscriber's answer we give the same value as before, but the final step on the part of the operators, since there are two successive disconnections to be made, requires two seconds more than in the single board connection.

* * *

From this analysis we see that in the one case almost fifty per cent. and in the other case thirty per cent. of the total time occupied in operating the average message depends entirely upon the subscriber. If the subscribers are generally in the habit

of answering the telephone bell promptly this proportion will be cut down and if they habitually disregard the first ring of the telephone bell it will be alarmingly increased. As we have said before, the central energy system has largely taken it out of the power of the subscribers to do their share of the operating very badly, since the simple acts of taking down and replacing the receiver automatically give signals that are clear and unmistakable to the operator. But the subscribers are still responsible for nearly half the total time occupied in operating the average telephone message. It will not escape the acute observer that at points (d) and (e) the subscriber still has it in his power to help or hinder the service. If he gives the number indistinctly or inaccurately he may cause a delay of several seconds here, and a delay may also arise from the operator hearing and repeating the number wrongly and the subscriber failing to check it. This is a quite important point and much time is certainly wasted by the giving of wrong numbers, but the most important responsibility of the subscriber is undoubtedly the answer to the call. While the telephone bell is ringing several miles of telephone line are tied up doing nothing, another subscriber is waiting at the other end, and part of the time of one and generally of two operators is being devoted to the supervision of the connection that is completed, but still useless until the called subscriber has answered the bell, taken down the receiver, and appeared on the line.

The Listening Key.

GRATIFYING FINANCIAL SUCCESS.

THE Local Telephone Company which was recently organized by Senator J. F. Laning is meeting with unusual success, says *Finance*. It has a capital of \$400,000, of which \$150,000 is 6 per cent. preferred. All of this stock, however, has not yet been issued. The company operates exchanges at the following points: Norwalk, Milan, Berlin Heights, New London, Greenwich, Chicago Junction, Attica, Monroeville, New Washington, Plymouth, Shelby, Crestline and Sulphur Springs. The following statement, sent out by the officers of the company indicates the present condition of the property with regard to its earning power.

	RECEIPTS.		EXPENSES.
	Rents	Tolls	and Taxes
July	\$1,806.91	\$572.41	\$1,255.25
August	1,847.41	575.20	1,258.38
September	1,860.00	593.85	1,350.00
Totals	\$5,514.32	\$1,741.46	\$3,863.63
Tolls	1,741.46		
For 3 months.....	\$7,255.78		\$3,863.63
Net earnings			3,392.15

This showing is despite the fact that Norwalk has not yet received the impetus of the new plant as it will next quarter, by the addition of 250 more new renters.

The figures do not include the earnings of the subsidiary plants of Shelby, Tiro and Crestline, in the stock of which our company has large controlling interests, nor the Wakeman plant, which is now building. These properties will add to the revenues of this company, upon its stock, at least \$300 per month, under present conditions, or \$900 per quarter. This will make:

Full gain per quarter.....	\$ 4,292.15
Gain per year.....	17,174.00

The first quarter, however, does not show up the real earning power of the properties. The plants are all yet new in our hands, and the economies resulting from consolidation are not as fully realized as they will be when we have progressed a little farther. Besides we are constantly developing the properties, and will soon add 25 per cent. more to the earnings by increase of patrons.

If we regard it that there will be from development and expense savings, a net 15 per cent. gain only, in earnings, in the last half of the year, as compared to the first, there will be annual earnings for first year, estimated \$18,462.05, a showing of which, naturally, we are exceedingly proud.

As it requires but \$9,000 to pay dividends at 6 per cent. upon our whole \$150,000 of preferred stock, when it is all issued, no holder of it need have any doubt as to receiving his earnings as promised.

THE INTERSTATE CONVENTION

FINAL arrangements have now been perfected for the coming Convention of the Interstate Telephone Association in Chicago on December 9th, 10th and 11th. The meeting will be held in the Auditorium Hotel which is by all odds, the best adapted place in the city. Over \$2,500 has been raised for the entertainment of delegates and operators, and a cordial invitation has also been extended to the ladies to be present and partake of the hospitality of the Association. Charles E. Hull and I. A. Lumpkin constitute the Entertainment Committee, which has arranged an entertaining program. P. C. Burns of the American Electric Telephone Company is Chairman of the Finance Committee.

The Manufacturer's Association held a meeting on the 20th, and perfected arrangements for entertaining the delegates. The manufacturers will tender a banquet on the evening of December 11, at which they expect to entertain 1,000 or more guests.

Arrangements have been made with the railroad companies for reduced rates to any one attending the Convention from the nine States embraced in the Association. The secretary, E. M. Coleman, is preparing a very handsome notice or invitation, including the program of the Convention which will be sent to all interested in the nine States.

The program for the three days will be as follows:

... Program ...

TUESDAY MORNING, DEC. 9TH, 1902.

Reception of Members and Friends by the Executive Committee at the Secretary's Headquarters and Inspection of Manufacturers' Exhibits.

TUESDAY AFTERNOON, 2 O'CLOCK.

Address of Welcome.—H. S. Taylor, Prosecuting Attorney, Chicago.

Response.—President H. C. Raney, Fairfield, Iowa.

Report of Executive Committee.

Report of the Secretary.

Report of the Treasurer.

Selection of Nominating Committee by the States to

Report on Call of the President.

WEDNESDAY MORNING, DEC. 10TH.

Rates:

Measured Service.—Geo. N. Bandy, Perry, Iowa.

Sliding Scale Rates for Exchanges.—Dr. H. S. Herr, Ottumwa, Iowa.

Toll Rates.—H. H. Robinson, Cleveland, Ohio.

Discussion.

Restrictions by Municipal Authority, Synopsis of the Law:

Ohio.—W. F. Laubach, Akron, Ohio.

Iowa.—U. S. Alderman, Nevada, Iowa.

Wisconsin.—J. C. Harper, Madison, Wis.

Minnesota.—E. E. Webster, Minneapolis, Minn.

Michigan.—J. B. Ware, Detroit, Mich.

Indiana.—E. W. Pickhardt, Huntingburg, Ind.

Illinois.—M. Savage, Champaign, Ill.

Missouri.—H. Linton Reber, St. Louis, Mo.

Kentucky.—D. E. Pendleton, Winchester, Ky.

Discussion.

WEDNESDAY AFTERNOON, 2 O'CLOCK.

Paper—Settlement of Toll Business between Connecting Companies. By A. L. Hutchison, Weyauwega, Wis.

Paper—Enforcement of Message Time Limit. By H. E. Ralston, Maitland, Mo.

Discussion.

THURSDAY MORNING, DEC. 11TH.

Papers—Independent Telephone Securities as an Investment:

(a) From a Banker's Standpoint.

By Col. J. D. Powers, Louisville, Ky.

(b) From Small Investor's Standpoint,

By J. H. Layne, Carthage, Mo.

Discussion.

THURSDAY AFTERNOON, 2 O'CLOCK.

Paper—The Berliner Patent, Bell's Claims of Infringement and Litigation now pending. By J. J. Nate, Chicago, Ill.

Paper—Suggested Methods for Improving Long Distance Telephony, by Senator C. E. Hull, Salem, Ill.

Opinion and Comment

COMPETITION—HERE AND THERE

ON another page our readers will find in the lively paragraphs of our collaborator who collects the "Foreign Currents" of the telephone field an abstract of a paper by Mr. J. E. Kingsbury, the well-known English telephone expert, on "The Future of the Telephone in the United Kingdom." Mr. Kingsbury deals mainly with telephone competition carried on by local authorities, which is the form that telephone competition has taken in England since the expiration of the Bell patents rendered telephone competition possible in that country. Mr. Kingsbury is not a believer in municipal telephony, and justifies his position by adducing several excellent arguments against competitive telephone systems operated by municipalities. He believes that such systems have no future, and will be absorbed sooner or later by the existing systems. Nevertheless, from what we read in the London technical journals, the movement in favor of municipal telephone systems continues to grow; two systems are in operation; a third is about to start, and there is a steadily increasing list of municipal corporations that have either decided in favor of a telephone system or are considering the question.

This shows that in England, as in this country, there is a demand for a cheaper telephone service than has hitherto been rendered, and a general feeling that the service furnished by the monopoly has been neither as reasonable nor as efficient as an up-to-date telephone service should be. Owing to the peculiar conditions that surround the telephone business in England, conditions that have grown more complex and generally unsatisfactory year by year, but flow in the beginning from the government monopoly legally established shortly after the invention of the telephone, the only way in which this demand for cheaper and more efficient service can be met is by means of municipal telephone systems. The municipalities can get licenses to embark in the business, whereas new companies could not. Municipal telephone systems are undoubtedly open to some of the objections urged by Mr. Kingsbury, and at the best are a poor method of competing with an active commercial rival. There is something in the telephone that requires purely commercial management for its best development. Departmental methods are only too apt to run counter to most essential measures for the real interests of the business.

So we see that although the English people are getting competitive telephony, they are getting it in an unpractical and limited way. How different the state of affairs on this side of the Atlantic! With complete freedom from government interference, no license, royalties nor conditions of any sort, competitive telephony flourishes as a purely commercial institution, and an institution that has had a phenomenally successful and flourishing career, with a future of unlimited possibilities before it. There may be some disadvantages in the operation of two telephone systems in the same locality, but competition in telephony has arisen, as in other industries, in response to a public demand. The survivor in the competition will be he who gives the best service and the widest facilities for the lowest price. In this country that is the only issue.

TRAINING TELEPHONE MEN

OF recent years there has been an awakening to the fact that a telephone man requires a special training to fit him for his duties. These duties were only a few years ago scoffed at. It was contended that any one who had a smattering of knowledge of electricity was fully equipped to handle all the details of a telephone exchange. "Any one with a grain of common

sense, and some knowledge of the principles of electric currents, magnets, etc., can manage or successfully operate a telephone exchange" was the opinion of those who professed to know. But there has been a very general reversal of this verdict. It is now recognized that for a man to successfully manipulate the complex and delicate mechanism known as a telephone exchange, he must have something more than common sense and a knowledge of principles. Common sense and the knowledge of the elementary principles are, of course, essential; but they do not constitute a telephone engineer. He must also be fitted and trained to all the intricacies and problems of the modern multiple switchboard, the cables, the power plant, the distributing and protecting apparatus, etc. He must understand, not only the theory, but the practice of all these parts. He must know the troubles to which they are liable, and he must know the best methods in vogue for overcoming these troubles. He must know every detail of construction, operation and management of a telephone property. In fact, a telephone engineer must know the business thoroughly, from beginning to end. And it is now realized and acknowledged that telephony is a feature of the electrical science that has peculiar situations, conditions and methods, such as are not found in any other branch of the industry.

A telephone engineer who has been carefully prepared to cope with and understand the various construction and operating problems met in the art, is invaluable and much sought after. In comparison with the enormous extent of the business, however, competent telephone engineers are scarce. There is a great demand for good, practical, thoroughly trained engineers who are telephone engineers in every sense of the word.

To meet this demand a new branch has been added to the curriculum of several important colleges, where hitherto the electrical engineering course was supposed to fit a person for not only dealing with electric lighting and power supply, etc., but also for telephony. This is the course in telephone engineering. Not only are the electrical colleges giving this course their attention, but the correspondence schools that have sprung up everywhere in the last few years are giving to those men who cannot afford the time necessary to a college course a good, practical telephone training by mail. In these telephone courses all the modern systems and apparatus are described, and the theory and practice taught the student. He is grounded, not only in the elements of electricity, but is practically trained in every detail of the art and all the problems to be met.

When he has finished the course and graduated either from the regular college or the home instructions of the correspondence school, he has learned all the fundamental principles involved in the practical working of a telephone system. But he is yet not proficient in the art. He has a good deal of the practical to learn. And he can get this, not in any school, but only by working and observing the working of some exchange actually in everyday operation.

There can be no doubt as to the good being accomplished by this telephone course in our schools and colleges. Not only are the telephone companies gaining by being able to secure proficient engineers who effect a saving in time and also in money by thoroughly understanding and appreciating the apparatus under their control, but the general public is receiving a constantly better and better service. The telephone course has at once taken a position in the front rank of electrical studies. Hundreds of young men all over the country are availing themselves of the advantages of a good telephone training. Telephony is now looked on as one of the most important branches of electrical science, and it is receiving the attention of good practical men as it most assuredly should.

IN THE OPERATING FIELD

SOUTH BEND, IND., PLANT IN OPERATION

THE new system of the South Bend Home Telephone Company, of South Bend, Ind., has been completed and is now giving service to over 1,000 subscribers. The company will give free service until December 1, when it expects to have at least 1,300 telephones in operation.

One of the latest, most complete and up-to-date plants in the country has been installed in South Bend. It represents an expenditure of about \$200,000, only the very best construction and apparatus being employed. Work has been going on for nearly a year. In the line construction 2,500 poles were set, 115,000 feet of underground conduit was installed, 150,000 feet of cable, aerial and underground, was used, and 1,000 miles of copper wire strung. The company also has constructed many miles of toll lines. It has two completed metallic circuit lines to Plymouth, connecting with several Independent exchanges en route. Two circuits have also been completed to Elkhart and Goshen, and one to Niles, Mich. A line was also built into Michigan City.

In addition to these, numerous shorter lines have been extended to all the principal towns and villages of the county. Toll stations have been established at Lakeville, Woodland, Wyatt, Osceola, Teegarden and North Liberty. A complete trunking system has also been provided between South Bend and Mishawaka, where an exchange is being built. It will be a couple of months yet before this latter exchange is put in operation. A 25-pair cable is connected to a trunking position on the South Bend switchboard and also the one at Mishawaka. Free service will be given between these two cities.

In the South Bend plant each subscriber is on an individual metallic circuit, no party lines being used. The rates will be \$30 annually for business houses and \$20 for residences.

The company did not build a new exchange building, but has completely remodeled an existing structure, making it into an ideal central office. The building is two stories high, with an imposing stone front. On the first floor is a directors' room, including a private office, the business office, a public office, and a supply and cable room. The operating room is on the second floor, and here also are located the batteries, terminal and relay racks, power generators and switchboard, the distributing racks, and two comfortable retiring rooms for the operators. The building is well ventilated, is lighted with both gas and electricity, and is heated by a hot-water system.

The Kellogg Switchboard and Supply Company installed the switchboard and furnished all other apparatus, including the telephones. The switchboard has an immediate equipment of 1,500 lines and an ultimate capacity of 6,000.

TELEPHONE CONSTRUCTION TROUBLES

THE manager of the Galion Telephone Company, Galion, O., has his troubles these days in his construction work. Mr. M. E. Taylor, the manager, has been having new lines constructed of late which necessitated the setting of several extra poles. The location of one of these was to be in an alley adjacent to the home of a family, Flanery by name. Flanery thinks he has a grudge against the world in general and the city authorities and telephone companies in particular. Several years ago he successfully thwarted the efforts of a telephone construction gang to set a pole in his alley.

When the telephone men began digging the pole hole, therefore, Flanery appeared on the scene with his revolver, which he fired off several times for luck and testing purposes. The telephone men, however, were not so easily frightened off. They continued their work. Flanery then got a shovel, and as fast as they took out earth he shoveled it back again. When the men refused to quit work, he laid a heavy club over their heads, and they decided that discretion was the better part of valor and fled to a magistrate, got a warrant and had the belligerent Flanery locked up on a charge of assault with intent to kill, etc.

They returned to their work, but the female portion of the Flanery family came upon the scene. The wife jumped into the hole and the daughter stood in such a way that the workmen could not proceed with their digging. The latter then began to dig several other holes in the vicinity, all of which the wife and daughter could not fill at one time, although they strenuously

endeavored to do so. It began to look as though a hole would at last be completed.

Here it was, however, that the reserve force of the Flanery clan was ordered out. It came in the shape of a formidable-looking shotgun in the hands of the son and heir. The workmen at once made an ignominious retreat.

But the telephone men had their revenge and the Flanery's their Waterloo. Peace warrants were sworn out for the whole family. The hole was dug, and amid the cheers of an immense crowd of sympathizing citizens, the pole was triumphantly reared aloft and securely fastened.

INDEPENDENTS IN DECATUR COUNTY, IND.

THE Independent Telephone Company, of Decatur County, Indiana, which is one of the best systems of its kind, originated about two years ago. On May 30, 1900, Samuel L. Jackson and M. E. Newhouse commenced to organize a company which was brought into existence the 14th of the next month. At the first meeting of the stockholders seven directors were elected, namely: Samuel L. Jackson, M. L. Miers, J. H. Christian, C. P. Miller, O. G. Miller, Charles Zoller, Jr. and T. E. Davison. The board of directors elected the following officers: President, S. L. Jackson; vice-president, M. L. Miers; treasurer, J. H. Christian; secretary, O. G. Miller. The system was put into operation in February, 1901, and began with 200 subscribers. Since that time the number has increased steadily, over 900 telephones being now in use. The paid-up capital stock of the company is \$22,100 divided into \$25 shares. The company is so organized that no one person is allowed to control more than four shares for the purpose of voting. Of the 900 telephones in use, more than 53 per cent. are in farm residences and villages, the remainder being in Greensburg. The company has long distance connections with Indianapolis and other towns. The system is the Stromberg-Carlson, electricity being supplied at the exchange building. All the city lines are individual. The company owns its own power plant and has been a complete success both financially and otherwise, and promises to pay dividends to its stockholders in a short time.—*Finance*.

A PHYSICIAN'S TELEPHONE LINE

DR. J. W. NICHOLSON, a physician in Centerville, a little country town in Georgia, was enjoying a fairly good-practice in the village, and nearby rural sections. But he was not satisfied. He was ambitious for more work, and yet didn't wish to leave his native town. He puzzled over the proposition for a long time, but could see no way by which he could extend his field of action, and at the same time stay where he was.

One day, however, a means came to him as if by inspiration. He had thought of the telephone.

"Why," said he to a friend, "can't I build a private telephone system out into the country? Then when there is need for a doctor in a hurry, I will get the patient because the telephone is quicker than a horse and buggy or other means of locomotion."

This was good logic, and the Doctor built the telephone line. And as a result, his practice has increased fully one hundred per cent.

AN OLD INDEPENDENT COMPANY

PEOPLE of Chester, S. C., have for ten years enjoyed a very good local telephone service. Chester is a small town, and several of the prominent citizens organized a company on the mutual or co-operative plan. Each one contributed his share of the general expenses, and a system that suited them perfectly was established. The plant now has over 300 subscribers, each subscriber owning also a share of stock worth \$10.

For several years outside parties have been trying to get control of the stock, and of late an attempt has been made with some success. Most of the subscribers are very much wrought up over this, as also are a majority of the stockholders. The Mayor of Chester, who has a big interest in the success of the system, has circulated a petition urging the stockholders to stick together and hold to their stock. He shows that the plant is enjoying a season of prosperity and that everything is in a good condition.

A better service, he points out, is now given the subscribers than they would enjoy were the plant sold to outside parties.

The manager of the system is now replacing the present poles with stouter and higher ones, and everything to make the service more efficient is being done. It is probable that Chester will continue to do its own telephoning.

MISSOURI RIVER ASSOCIATION

MEMBERS of the Missouri River Independent Telephone Association held a meeting in St. Joseph recently to consider a proposition for granting a connection with farmers' lines throughout Buchanan and Andrew counties.

Members declare that reports made public to the effect that arrangements had been completed for the admission of 2,000 individual telephones were without foundation and injurious to the association.

It is declared, however, that under proper restrictions, with arrangements mutually beneficial, plans may be completed by which the association's lines will reach every rural neighborhood in the two counties named.

CANADIAN MUNICIPAL SYSTEM

CONNECTION has been established with Port Arthur over the wires of the municipal telephone system of Fort William, Ontario. In order that the occasion might be recognized as being one which marked a great step in the progress of the town, the Mayor of Fort William, the telephone committee and other citizens met in the central office of the town and by previous arrangement the Mayor of Port Arthur visited the Port Arthur central office, and the two offices were connected.

The interchange of courtesies which followed was the first official message sent across the municipal wires between the two towns, and may be said to inaugurate the service. From this time the individual subscribers will be connected with the system as rapidly as possible.

ENCOURAGING PROGRESS AT PURDUE

THERE are now twenty-four students at Purdue University enrolled in the course of telephone engineering. Sixty others of the present sophomore and freshman classes are taking work preparatory to telephony in their junior and senior years. The telephone manufacturing and supply houses are taking much interest in this course, as well as the operating companies. Much valuable apparatus has been donated by the former, which is used in practical explanation of the working of the various systems of switchboards and appliances.

The Stromberg-Carlson Telephone Manufacturing Company sent Purdue a complete central energy two-line equipment exchange; also a complete double disconnect cord circuit and operator set, all of the latest type manufactured by the company.

The Swedish-American Telephone Manufacturing Company has sent transmitters, receivers, repeating coils and induction coils.

The Clark Automatic Telephone Switchboard Company sent a complete subscribers' dial and appliances.

The Western agent of the Nungesser Electric Battery Company sent a dozen of its 1900 cells, which are used in the local battery laboratory work.

A ringing generator for alternating and pulsating currents, 20 cycles, is now being installed, and also a generator giving frequency of 60 cycles.

Two sound-proof booths have also been installed. The faculty has also the advantage of having lines entering the campus exchange, which are used in showing the necessity of balancing conditions, etc. All inductive effects of single, double and triple-phase alternating currents, high and low-tension, as well as continuous current, can also be fully and accurately observed.

All these facilities for studying conditions as they actually exist undoubtedly will have a good effect in qualifying students to become telephone engineers.

MICHIGAN TELEPHONE COMPANY

THE bondholders' protective committee of the Michigan Telephone Company has decided to ignore the alleged plan of reorganization as outlined by the so-called protective committee of the stockholders and to proceed with their own plans, according to the *Boston Statist*. Without

the co-operation of the bondholders there could be no possibility of the plan being consummated and the chances of the minority stockholders receiving any serious consideration are very slim.

The situation as it stands to-day can be briefly summarized as follows:

A default having been made in the interest on the \$5,000,000 of 5 per cent. bonds, the bondholders have a prior lien on the property as a whole, and in the event of the sale of the property to any other company or in any reorganization would be the controlling factor. After the bonds comes the floating indebtedness of which the American Telephone & Telegraph owns approximately \$2,182,000, and after these would come the common stock. Of the total issue of \$5,000,000 the American Telephone & Telegraph Company owns \$3,687,300, leaving only \$1,312,700 owned in Michigan and elsewhere.

The bondholders with the American Telephone & Telegraph Company will undoubtedly apply for the appointment of a receiver who will take over the property until such time as a plan of reorganization can be agreed upon. That it will differ materially from the plan outlined by the common stockholders, or to be more exact, a few of them, follows without saying.

The feature of the stockholders' plan of reorganization which practically stamps it as impossible, was the priority given to the floating debt over the bonds. In both plans provision was made for the scaling down of the bonds, in one instance to 60 per cent., and in the other 90 per cent., while the floating debt was retained at par. While the American Telephone & Telegraph Company refused to accept an offer for this indebtedness, the fact that the bondholders' committee made what was simply a nominal offer for it to clean matters up, would indicate how much consideration would be given it in a plan of reorganization.

The calling of an assessment upon the common stock, which would be voluntary only because of the non-assessable clause, may be resorted to, but the difficulty of collecting an assessment of, for instance, \$55 when the stock is selling at \$6 a share, is fairly apparent.

A plan of reorganization on reasonable grounds will probably be suggested by the bondholders' committee and that the minority stockholders will be an important factor in this is not generally believed.

ILLINOIS COMPANIES MEET

REPRESENTATIVES of all the Independent telephone companies in the vicinity of Jacksonville, Ill., held a meeting there recently. The purpose was to formulate a system for the collection of tolls and for all other purposes of interest to the association. The object of the toll system agreement is that each company may secure direct connection with all other companies. The different companies were represented as follows:

The Macoupin Telephone was represented by A. F. Loehr; the Modesto Telephone Company, by J. A. Fletcher; Medora Telephone Company, by J. F. Still; Shipman Telephone Company, by M. M. Meatyard; Brighton Telephone Company, by Walter G. Hunt; Girard Telephone Company, by J. E. Huff; Chesterfield Telephone Company, by W. J. Finch; Scottsville Telephone Company, by E. O. Turner; Hettick Telephone Company, by P. L. Doty; Piasa Telephone Company, by E. H. Forwood.

A BRAVE CHIEF OPERATOR

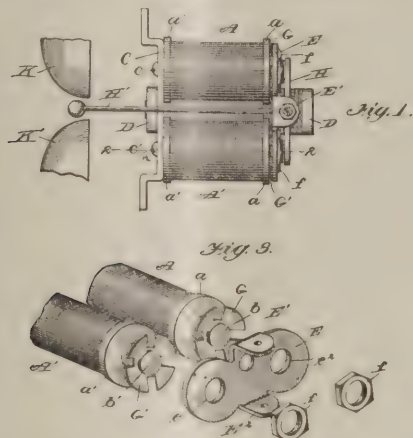
WHEN a telephone wire became crossed with an electric light wire in Brooklyn, and fire flashed from the wire rack in the Flatbush Central Exchange, the telephone girls fled in a panic, says the *New York Herald*. They forgot to shout "Fire!" but, from force of habit, after pushing up the front window sashes, three of them screamed, "Hello! Hello!"

Directly beneath the exchange is the Sub-Post Office station. The clerks heard the shouts and thought some of the girls were disposed to joke with them. The whole place might have been burned out through a misunderstanding had it not happened that Helen McMahon, the chief night operator, recovered herself and sent in a fire alarm.

When the firemen came Miss McMahon directed their efforts, cautioning them which wires to avoid as they pulled out the blazing woodwork and extinguished it. About \$500 worth of damage had been done before the blaze was stamped out.

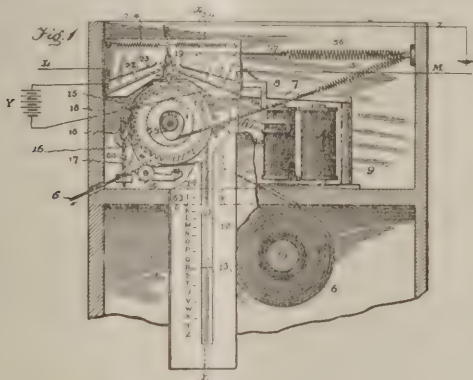
Patents

Charles L. Burlingham, of Chicago, Ill., patents (No. 710,946, October 14, 1902) and assigns to the McDermid Manufacturing Company an electric bell. This invention refers especially to magneto bells, and is a device for accurately adjusting the distance of the armature from the pole pieces. As shown in the drawings,

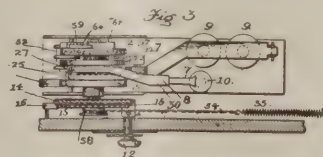


the yoke holding the armature is mounted on the projecting pole pieces and held in place by the nuts *f f* acting against the pressure of the flat springs *G G*. The turning of the nuts will therefore regulate the adjustment of the armature as desired.

William F. Smith, of San Francisco, Cal., patents (No. 711,453, October 14, 1902) a message transmitting and recording mechanism for telephone systems. This invention is a device for printing messages, etc., on a paper tape, and is designed for use on telephone systems. Should the called party fail to answer, a message can be recorded on the tape at that station and be read



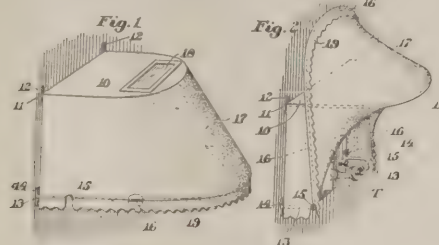
on the subscriber's return. The letters, characters, etc., are mounted on disks, which are moved into position by a ratchet and pawl used as a step-by-step mechanism, the power being supplied by the necessary electro-magnets. The electric impulses



for operating the magnets are sent out by the moving of a sliding button 12 opposite to the desired letter or figure. A cord attached to this button causes a toothed wheel to rotate, and the teeth, engaging a moving piece 19, make the necessary connections operating the magnets in the second machine. When the button is released the print is made and a spring returns the toothed

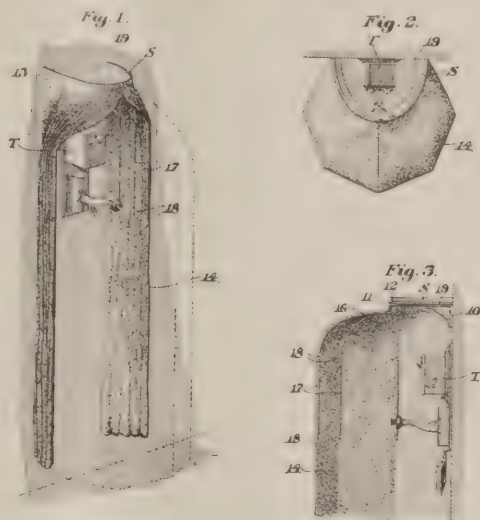
wheel to place, making a second connection which restores the printing wheel to its normal position. The printing is performed by means of an impression pad being forced against the paper strip at the proper time, and as each letter is made the strip is moved along in position for the next letter. The printing and sending apparatus is intended to be entirely separate from the telephone itself, being used only as an auxiliary mechanism.

Albert J. Parke, of Boston, Mass., patents (No. 711,588, October 21, 1902) an inclosure for telephones. This invention consists of a device for partially inclosing a telephone during use, and is so



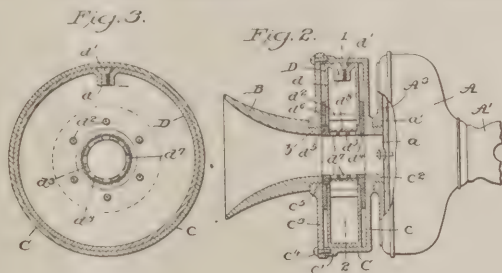
arranged as to be easily removed when desired, allowing instant and easy access to and from the telephone. It is in the form of a hood and can be pulled down during conversation, thus partially cutting off the outside noise and also muffling somewhat the voice of the user.

Albert J. Parke, of Boston, Mass., patents (No. 711,589, October 21, 1902) an inclosure for telephones. This invention relates to a device very similar to the preceding, but is made in the form of a curtain in place of the hood. This curtain is held in position



by metal supports, which are pivoted at the top and can be swung together, making a tight enclosure on all sides. The top is intended to be of glass or other transparent material, so as to admit light into the interior.

Joseph W. Brown, of Philadelphia, Pa., patents (No. 711,615, October 21, 1902) and assigns to J. G. Brown a mouthpiece for



telephone transmitters or speaking tubes. This invention consists of a hollow casing which is attached to a telephone transmitter or speaking tube, and to which is attached the ordinary bell-shaped mouthpiece. This casing is so arranged as to leave a proper passage for the voice waves and also to hold a solid or liquid germ destroying matter, which will be gradually discharged into the voice passage through perforations *d*, thus destroying any germs which may be deposited in the mouthpiece or passage by the speaker.



New Companies

SCOTTSBORO, ALA.—A company has been formed here for the purpose of running a line to Tupelo. The company is composed of the following: Cunningham & Campbell, Precise Brothers, Precise & Co., I. N. Bynum, Ben Riddle, J. M. Card, W. A. Gold, J. J. St. Clair and M. L. Cheshire.

CABOT, ARK.—The Cabot & Lonoke Telephone Company has been incorporated with a capital stock of \$1,500, of which \$1,000 has been subscribed. It is proposed to erect and operate a line from Lonoke to Little Rock via Cabot. George Rule, Jr., is president and treasurer; R. G. Stovall, vice-president, and W. A. Thompson, secretary.

ESCONDIDO, CAL.—Citizens of this place are planning to form a co-operative telephone company to give local service and also serve a number of neighboring communities. Subscribers are now being canvassed for, and as soon as a proper number are secured stock will be issued and a company incorporated. All towns between here and Oceanside will be connected, and also Palomar, Julian, Ramona and other points.

DENVER, COLO.—The Local (Independent) Telephone Company has been incorporated with a capital stock of \$500,000, at \$1 a share. The directors are S. L. Clough, C. M. Brady, J. D. Malcom, J. H. Hagerman, of New York and Boston, and H. H. Hake, of Denver. The principal office will be in this city. A franchise will be asked for to construct and operate a system here, after which it is proposed to run lines all over the State.

FOWLER, ILL.—The Fowler Central Telephone Company has been incorporated with a capital stock of \$2,500. C. C. Haxel, L. E. Schriver and H. Schroeder are the incorporators.

CRAWFORDSVILLE, IND.—Plans are being prepared here for a new co-operative telephone company. Several meetings have been held, and the people are enthusiastic over the plan.

GREENFIELD, IND.—Chas. Hanna, Emery Pratt and several other farmers are canvassing the public to take stock in a new telephone company which they propose to install in Greenfield and over the county. Shares of stock are \$20 each.

PIKESPEAK, IND.—The Pikespeak Telephone Company has been incorporated. It will operate lines in Brown, Bartholomew and Jackson counties. The capital stock is \$2,000.

SEYMOUR, IND.—The Seymour Home Telephone Company has been incorporated with \$50,000 capital stock to operate a complete telephone system and exchange here. Ed. L. Barber, C. Seymour, J. C. Montiet, J. H. Andrews, J. H. Peter and Seba A. Barnes are the incorporators.

STEWARDSON, ILL.—The Stewardson Telephone Company has been incorporated with a capital stock of \$2,500. The incorporators are: T. P. Mantz, D. M. Duddleston and William Frede.

BOONE, IOWA.—The Grant Township Telephone Company has been organized. The following are the officers: L. P. Lundval, president; A. Westeen, secretary, and John Malimquest, treasurer.

LACEY, IOWA.—The Mutual Telephone Company has been organized to construct a system here.

BUENA VISTA, KY.—A new telephone company is being organized here to construct a line between here, Bryantville and High Bridge.

BOSTON, MASS.—The Power, Speed and Controllor Company has been incorporated with a capital stock of \$100,000. Besides several other objects, the company constructs telephone and telegraph lines. Incorporators: Edgar D. Gould, Charles Whittner Ward and John L. Roban.

EMMONS, MINN.—Mr. Guthrie and Mr. Freeman, of this place, are organizing a telephone company to give service local and to farmers in the vicinity.

JEFFERSON CITY, MO.—Articles of incorporation of the Central States Telegraph, Telephone and Construction Company have been filed here. The company has a capital stock of \$50,000. Incorporators: W. F. Rankin, of Tarkio; S. M. Baker, of Atchison, and others. The object of the company is to build toll lines between St. Joseph, Atchison, Leavenworth and Kansas City, and other towns in that territory. The independent companies in these cities will operate their lines in connection with the toll lines of the new company.

ST. JOSEPH, MO.—Holt County farmers have organized the Farmers'

Mutual Telephone Company and are installing a central office in Maitland. The company proposes to bring its lines into this city, and also to secure connections at the stock yards. The farmers want to know something of the market quotations before they ship stock, and they have arrived at the conclusion that mail quotations are too slow.

GOWANDA, N. Y.—The Gowanda Telephone Company has been incorporated with a capital stock of \$25,000. Directors: E. C. Fisher, J. M. Congdon and R. E. Congdon, of Gowanda.

JEFFERSON, N. Y.—An effort is being made to interest the people here in a new telephone line, to be built between this place and Charlotteville.

NEW HOLLAND, PA.—The Enterprise Telephone and Telegraph Company, which was organized here recently to operate a line to Reading for the farmers has a capital stock of \$25,000. Its officers are as follows: President, W. M. Stauffer, New Holland; treasurer, E. H. Burkholder, Farmersville; directors, M. T. Ziegler, Bowmansville; J. G. Burkholder, Denver; Harry M. Stauffer, Lola; Eli M. Martin, Dr. W. M. Stauffer, George Bair, New Holland; Solomon High, Blue Ball; Dr. B. J. Reem-snyder, Hinkletown.

UNIONTOWN, PA.—Uniontown people, disgusted with the poor and unreasonable service of the Bell Company, will probably organize a local telephone company. If this cannot be done, some independent company will be asked to construct and operate an exchange here.

MURFREESBORO, TENN.—A new telephone company, known as the Home Telephone Company, has been organized here. Walter C. Frost is the chief promoter.

EL PASO, TEX.—The Southern Independent Telephone Company, of El Paso, has been incorporated with a capital stock of \$500,000, to construct and operate a system in this city and county. Incorporators: Annie McElroy Brett, Loraine Miller, J. B. Badger and B. S. Spragge, all of El Paso, and D. P. Vanswearinger, of Cleveland, O.

TYLER, TEX.—The Globe Telephone Company has been incorporated, headquarters here, with a capital stock of \$25,000. It will construct and operate telephone lines and exchanges in Smith, Wood, Van Zandt, Anderson, Henderson, Navarro, Cherokee, Rusk, Gregg, Harrison and Camp counties. The incorporators are S. F. Richardson, C. C. Crens, J. T. Harris, J. R. Adams, all of Tyler, and J. B. Cave, of Dallas.

LAMBERT, VA.—It is reported that Lambert's Point will in the near future have a telephone system of its own. There is serious talk among the moneyed men and the merchants of installing telephone communication throughout the district of Tanner's Creek by means of wires independent of the Southern Bell Company and the Southern States Company, both of whom have customers scattered about here. The rates of the new telephone will be considerably lower than those of either of the companies now serving the people. A number of subscriptions to the new telephone company have already been obtained, including the Country Club and the Sewall's Point Railroad.

Financial

INDIANAPOLIS, IND.—At a recent meeting of the board of directors of the New Telephone Company a resolution was adopted authorizing a 6 per cent. dividend per annum. This dividend will be paid quarterly. A dividend of 1 1/2 per cent. was therefore declared, payable November 1, to all stockholders of record, October 25, 1902.

ATWOOD, ILL.—The Atwood Mutual Telephone Company has increased its capital stock from \$4,000 to \$6,000.

DAVENPORT, IOWA.—At a meeting of the Iowa Telephone Company, held in this city recently, a quarterly dividend of 1 1/4 per cent. was declared.

DUBUQUE, IOWA.—The executive council of this State has changed the assessment of the Dubuque Telephone Company, which was assessed at \$1,600.50 per mile in this city. The reduction made amounts to \$538.43 per mile in the city. The total taxable value, however, remains the same. The change made by the council reduced the valuation per mile and added five and one-half miles omitted in the report.

BOSTON, MASS.—The Hudson River Telephone Company has declared the regular quarterly, 1 1/2 per cent. dividend, payable November 1. Books close October 20, reopen November 2.

THE WEEK'S MESSAGES *Continued*

VERMILION, O.—The Vermilion Telephone Company has increased its capital stock from \$25,000 to \$50,000.

Rates

UNIONTOWN, PA.—The Bell telephone rates have been raised here, and the next advance is expected in Connellsville. Business houses will be charged \$45 and residences \$33. A fee will be charged to any person talking outside the borough limits.

BARABOO, WIS.—The Baraboo Telephone Company is preparing to increase its rates so that its charges for business houses will be \$24 and for residences \$15. The reason given is that many new improvements and extensions are contemplated, tending to very much improve the service.

Elections

GENESEO, ILL.—At the annual meeting of the Henry County Telephone Company the following officials were elected: President, Thos. Nowers; vice-president, Daniel Porter; secretary, Geo. W. Murphy; treasurer, J. F. Nowers; directors, W. W. Cole, Geneseo; W. W. Adams, Atkinson; Wm. Statz, Kewanee, and to fill vacancy, I. T. Weekley, of Atkinson. The company is in a flourishing condition, having 230 telephones now in use, a gain during the past year of 103 instruments.

OTTAWA, ILL.—At a meeting of the Ottawa Home Telephone Company the following officers were elected: President, Roy C. Packard, of Toledo, O.; treasurer, Al. F. Schoch, of Ottawa; secretary and general manager, A. C. Godfrey, of Ottawa. The material for the new company, including the tools, has commenced to arrive.

HANNIBAL, MO.—W. E. Keeler has been elected treasurer of the Bluff City Telephone Company.

MILLERSBURG, O.—The stockholders of the Millersburg, Wooster and Orrville Telephone Company have elected officers for the ensuing year as follows: George Adams, president; Frank L. Beam, of Mt. Vernon, vice-president; B. C. Sill, secretary; John E. Koch, treasurer, and M. M. Herron, general manager.

CHESTER, VT.—The Green Mountain Telegraph and Telephone Company held its annual meeting recently and elected officers for the following year.

Competition.

PARKERSBURG, W. VA.—The West Virginia Western Telephone Company is getting its system in shape by November 1, so as to handle a large influx of new subscribers. Every Bell telephone has been ordered out by that time, except those for long-distance use exclusively, on account of the raise in rates.

Combinations

WRENS, GA.—The Whiteley Telephone Company, which owns the telephone line from Wrens to Bath, has purchased the one that runs from Wrens to Gibson. The company will construct a metallic circuit from Bath to Gibson.

EYOTA, MINN.—Dr. Adams, of Elgin, was here recently looking after the interests of the Elgin Telephone Company, which, it is understood, is contemplating a consolidation with the Viola Telephone Company, which connects with this village.

RUSH CITY, MINN.—At a meeting of the directors of the Northeastern Telephone Company, held in this city, an important transfer of stock was made, bringing J. R. Beggs, J. J. Murray, and Charles Avery, of the Minnesota Mutual Telephone Company of North Branch into active control of the local line. Those retiring from the company are: Dr. A. J. Stowe, president; J. D. Markham, secretary, and J. B. Martell, director. The North Branch Company will assume active control at once, and the exchange will be put into perfect running order and much improved under the supervision of Manager Charles Avery. J. R. Beggs assumes the presidency and J. J. Murray the secretaryship, made vacant by the retirement of the local officers. The Northeastern Telephone Company was incorporated with headquarters at Rush City January 12, 1900, and now has over thirty stations in operation, covering several hundred miles of line, all of which will now become a part of the Minnesota Mutual's system.

ROSEWOOD, O.—Murray E. Weimer has purchased the thirteen miles of lines in this city owned by the United Telephone Company, of Bellefontaine. The price paid was \$200 per mile. Possession is given at once. The deal brings the Independent companies' interests in this county together. Mr. Weimer previously owned a small line in the northwestern part of this county, and the new purchase increased his holdings considerably.

Franchises

POMONA, CAL.—The Pomona Valley Telephone Union has been granted a franchise to do business in this city.

KEOKUK, IOWA.—J. C. Hubinger, of this place, has been granted permission to construct a telephone line from Beuna Vista to Kahoka, Wyconda and other Clark County towns.

MONTEZUMA, IOWA.—Chester Allison, M. L. Miller, George Darland

and O. O. Riggs, representing the Mutual Telephone companies of Mahaska, Keokuk and Poweshiek counties, were here recently with the purpose in view of getting a franchise to operate a telephone system here.

KANSAS CITY, KAN.—The council has granted a franchise to Howard Jackson to build and operate a conduit telephone system in this city. The ordinance provides that the rate for business telephones must not be more than \$54 per year, and for residence telephones \$48 per year.

KALAMAZOO, MICH.—The Kibbie Telephone Company has asked for a franchise to construct and operate a system here.

OMAHA, NEB.—Mayor Koutsy has called a special election for a vote on the application of the Interstate Independent Telephone Company, which is asking for a franchise to maintain and operate a telephone system in this city. The officers of the company complied forthwith with the law, and deposited with the city clerk \$350, the amount required to conduct the special election for this purpose.

SYDNEY, NEB.—A franchise has been granted here for the construction of a local telephone system.

GLOUCESTER, N. J.—The Gloucester County Board of Freeholders have granted the Eastern Telephone Company the use of the county roads from Woodbury to Newfield along which to string wires.

LAMBERTVILLE, N. J.—William S. Newman has presented a petition to the common council asking that the franchise granted to himself and Samuel J. Pickering in 1900 to construct and operate a telephone system be transferred to the Merchants' and Farmers' Telephone Company, of Sergeantville.

MURFREESBORO, TENN.—The board of aldermen have just granted a twenty-year franchise for putting in a telephone system here to W. C. Frost and others. Great dissatisfaction exists with the Bell company, and the new system will be a popular movement.

RICHMOND, VA.—The Richmond Telephone Company has been given permission to string additional wires and cable in the underground district subject to the underground ordinance which provides for all wires to be in conduits by March 15, 1903.

SEATTLE, WASH.—The Independent Telephone Company, of Seattle, has been granted a fifty-year franchise at a recent meeting of the West Seattle council. Shortly before the incorporation of the Town of West Seattle last December, the Sunset company tried to steal a march on the residents by throwing poles promiscuously about the streets, but was promptly told it could not do business without a franchise. It subsequently applied for a franchise, but it was anything but acceptable to the people, as it intended to charge toll to Seattle and set its poles only in the streets, instead of the alleys. This caused considerable delay, when finally it accepted the terms of the council and promised to begin the construction of the plant within sixty days, but again failed. This time the council pronounced the poles a nuisance and ordered the Sunset company to remove them within five days, which was done. Naturally the citizens were much exercised over their failure to get telephones, and the action of the Independent company is much appreciated. Mr. Claypool, manager of the Independent Telephone Company, has promised to install a plant immediately, charge the same local rates as are in effect in Seattle and give free connection with Seattle.

Underground

BELVIDERE, ILL.—The Belvidere Telephone Company is working on the conduits through which will run eight 100-pair cables. As soon as this work can be completed Manager Brown will throw a force of men upon the extension to Cherry Valley, where the Belvidere line will be met by the new Rockford Independent Telephone Company getting a service with Rockford all along the route between here and Rockford. A toll station will be put in at Cherry Valley.

DAVENPORT, IOWA.—The work of laying the conduit for the underground system of the new Independent system is progressing rapidly.

BUTTE CITY, MONT.—The Rocky Mountain Telephone Company will put all its wires here under ground, in accordance with the provisions of an ordinance which was passed by the city council recently.

CANANDAIGUA, N. Y.—It is announced that the Canandaigua Telephone Company is to be organized into a stock company. Plans are under way to construct additional underground conduits and enlarge the system.

CATSKILL, N. Y.—The Rawson Electric Telephone Company is installing its underground cable. General Superintendent P. J. Fitzgerald, of Albany, is superintending the work.

PORTLAND, ORE.—A proposition has been made by the Columbia Telephone Company to the Board of Public Works for laying underground wires in the business district of the city. The plan has been referred to a committee. A plan is also under consideration by the Columbia Telephone Company for an improvement of its plant and extensions.

THE WEEK'S MESSAGES *Continued.*

CONNELLSVILLE, PA.—The Connelleville Conduit Company has been granted a franchise to place conduits under the streets for telephone, telegraph and all overhead wires.

WILLIAMSPORT, PA.—The Pennsylvania Telephone Company is preparing to lay four lines of underground conduit here, the work to be started in about two months.

Construction.

NEW DECATUR, ALA.—The Morgan County Telephone Company, which was recently given a franchise here, is receiving poles and making arrangements to commence its construction work within a short time. It claims to have 4,000 subscribers, and will compete with the Bell company.

MIAMI, FLA.—The Miami Telephone Company has recently installed a new switchboard. The company expects to extend its line as far north as Fort Lauderdale before the shipping season commences. Captain Sanders and Mr. Gramling, the managers, are making every effort to give Miami the best possible service.

CARBONDALE, ILL.—The Carbondale Telephone Company has commenced the construction of a new line to Makenda.

OTTAWA, ILL.—Work on the construction of the new Ottawa Home Telephone service has begun. The company will install 600 instruments of the latest pattern, and the switchboard will have a capacity of 1,500 lines. There will be about a mile and a half of conduits, four miles of cable and about four hundred miles of copper wire put in place within a few months. The system will be completed February 1.

ROCK ISLAND, ILL.—The switchboards for the Independent Telephone Company have arrived, and the engineer for the Sterling Electric Company is here putting the boards in place. A carload of telephones have also arrived, and are being placed in the homes of the subscribers. All the cable for the underground work in Rock Island has arrived, and the placing of it will begin in the near future.

ELKHART, IND.—The Home Telephone Company has practically decided to install a new 2,400-line central energy switchboard during the coming winter at a cost of \$24,000. The company has contracts now for 300 telephones.

WABASH, IND.—The Wabash-Logansport Telephone Company will construct a new line on the north side of the river, between Wabash and Peru, to be used exclusively for through business.

BURLINGTON, IOWA.—A new police telephone system is being installed here at a cost of \$50,000.

CARROLL, IOWA.—The Carroll County Telephone Company is rapidly extending its system all over the county. Its farm lines now extend through Carroll, Knist, Sheridan, Grant, Pleasant Valley, Roselle and Arcadia townships, and it already has 200 subscribers.

HAWKEYE, IOWA.—The Hawkeye Telephone Company expects to erect three, and perhaps four, rural telephone lines running out from Greenfield this fall. One line will run north and connect with the Menlo line; one will run southeast of the city; the present line will be lengthened, and perhaps a line to Nevinville will be constructed.

MILFORD, IOWA.—Q. C. Fuller and J. L. Bascom were at Spirit Lake recently in the interest of the Midland Telephone Company. It is the intention of the company to build a line to the county seat, and thus give the people of this community as well as those of Spirit Lake better service. The line will connect with all of the rural lines in this part of the country.

PATON, IOWA.—The Green County Telephone Company is putting in an extensive system here, connecting Paton with the farmers as well as other towns.

BARBOURVILLE, KY.—The Camp Ground Telephone Company, which has headquarters here, will construct a line from this place to the oil fields.

PORTLAND, MICH.—The Citizens' Telephone Company is constructing a new exchange here at a cost of \$10,000.

SAGINAW, MICH.—The Saginaw Valley Telephone Company will make extensive additions and improvements to its system early next spring. It recently declared the usual quarterly dividend.

ALEXANDRIA, MINN.—At a recent meeting of the directors of the Interurban Telephone Company, it was decided to construct an exchange here. The directors of the company are H. T. Holverson, C. J. Gunderson, C. H. Raiter, Tollef Jacobson, Thomas Brusegaard, O. F. Olson, Joseph Mathiesen, P. J. Wrangelborg, J. P. Hedberg, H. L. Lewis, John Freborn and R. Vallquist.

MANKATO, MINN.—A meeting of the directors of the new toll line company that is running a competing line from the twin cities to Mankato was held recently. It was reported that the line has been constructed as far as the Minnesota River, near Shakopee. An extra crew has been put on

at New Prague to work northward. It is expected that the new line will reach Mankato in thirty days. The contract with the Twin City Telephone Company, by which the two lines will work in conjunction with each other, was signed.

REDWOOD FALLS, MINN.—The Redwood County Rural Telephone Company, organized last spring and which already has sixteen miles of line in operation, will soon extend its lines from Wabasso to Morgan, a distance of twenty miles. The company will put in a central exchange at Morgan with forty telephones. The company is expected to pay a dividend at the end of the year.

FULTON, MO.—C. W. Buffum, president of the Louisiana Telephone Company, and J. C. Thornton, electrician for the company, were here recently looking after the local affairs of the company. Some needed repairs have been made in the switchboard at the central office here, and the lines have been inspected. Mr. Buffum stated that Mr. T. W. Rosser, manager of the local yard of the La Crosse Lumber Company, would be the manager of the telephone system in Fulton. Mr. Buffum says that the company is preparing to do some extensive improving next spring, and that Fulton people may expect a perfect telephone system.

HANNIBAL, MO.—The management of the Bluff City Telephone Company is going right ahead with the work of installing its new exchange in the city, which will be put in at a cost of \$70,000. Mr. Munsell, who will have charge of the construction work, is now in Hannibal to remain until everything is completed. The company has leased a building, and will use it for a storage room in which all of the supplies bought for the construction of the exchange will be kept. The building for the central office of the company has not been secured as yet. The company has three buildings in view with options on all.

FALLS CITY, NEB.—The Falls City Telephone Company is constructing a line from here to Salem, for the convenience of farmers and others.

KEARNEY, NEB.—The Home Telephone Company is stringing wire on the new line connecting Kearney and Gibbon. This work is a part of the system inaugurated by the Farmers' Home Telephone Company of Shelton, and will cover the entire southern part of the county, including an extensive farm service.

SALEM, N. J.—The switchboard for the new local exchange of the Interstate Telephone Company has arrived, and is being installed.

ELLCOTTVILLE, N. Y.—Telephone poles are being distributed from Ellicottville to Upper Sugartown, for the connection with Great Valley and Humphrey.

RANDOLPH, N. Y.—A toll line is being constructed between Randolph and Jamestown. The Home company at Jamestown will be joined with the local company here as soon as the line is completed.

RUTHERFORDTON, N. C.—Work on a new telephone line from this place to Poor's Ford, Polk County, has been begun.

BELPRE, O.—The Home Telephone Company, of Coolville, has received the wire, switchboard and thirty-five telephones to be used in Belpre and vicinity. The company has just completed the setting of the poles that are needed at present, and a force of men commenced stringing the wires.

CALDWELL, O.—W. H. Bowron, of the Caldwell Independent Telephone Company, has made arrangements to extend his lines to Marietta, and has purchased the poles and copper wire for the extension. He expects to have it built some time next month. He will make connection with the Marietta Independent line.

CINCINNATI, O.—The Miami and Erie Transportation Company is putting in a telephone system to cover every part of its route.

LEBANON, O.—The Valley Telephone Company has commenced the construction of its new plant here. It will put in eight thousand cables and an entire new full metallic system with the latest improved switchboard.

SPRINGFIELD, O.—The Springfield and Xenia Telephone Company, which has a franchise for constructing and operating a system in this city, is constructing a handsome new exchange building. The company expects to have its system completed and in operation by March 1, 1903.

CATASQUA, PA.—The Lehigh Telephone Company has a force of men here improving its service.

LATROBE, PA.—The Federal Telephone Company will install an exchange here, and improve the existing service. A new toll line will be built at once from Wilkinsburg to Latrobe, taking in Wilmerding, Pitcairn, Irwin, Penn, Manor, Greensburg, and, in fact, all the towns on the route and giving Latrobe connection with them, as well as with the towns in the Mongahela Valley and Washington and McKeesport. The material for the construction of this new line is on hand, and work on it will be pushed. It is also expected to have connection with Indiana and Johnstown and on farther east before long.

READING, PA.—With the election of W. Kerper Stevens, Isaac Heister and A. J. Brumback as new directors the Consolidated Telephone Company expects to still further enlarge its field of operation. Work on new lines to various towns is now planned.

THE WEEK'S MESSAGES *Continued*

SHARON, PA.—Two new telephone exchanges will be opened in this vicinity in the near future. The Union line, which was formerly called the Mercer County line, will soon have an exchange in the town of Stoneboro, this county, and there will be an Independent line run through the town of New Bedford, in Lawrence County, and an exchange opened. At the present time New Bedford is connected with the outer world only by the Bell company, which has a pay station in the town. The Sharon Coal and Limestone Company has constructed about twenty-five miles of line from here to their coal and limestone works, near Grove City and Plain Grove. They have a score or more of telephones in working order.

ULSTER, PA.—The Bradford County Telephone Company is extending its line in the lower part of Sheshequin Township, and will add a half dozen subscribers to the exchange here.

YANKTON, S. DAK.—At a meeting of the Business Men's Club, held recently, a resolution was adopted to let the contract for an Independent telephone system for the city of Yankton to W. H. Crumb & Co., of Chicago, for the sum of \$13,000, that being the lowest of several bids submitted. The system provides for bonding the company for \$20,000, \$5,000 of which sum is to be held as capital stock, \$2,000 to be given the promoters as a bonus, and \$13,000 to be sold at par in the form of twenty-year 6 per cent. gold bonds, a common stock certificate of \$100 to accompany each bond free. Work will begin on the system as soon as the money for its construction is raised, and it will be pushed rapidly to completion. It is expected to have it in working order by January 1, 1903.

McKINNEY, TEX.—The McKinney Telephone Company is making many improvements to its service here.

SAN ANGELO, TEX.—The San Angelo Telephone Company is making extensive improvements to its service here. It is putting in new poles, stringing cable, taking down overhead wires, etc. When the present improvements are completed the company will have 2,220 feet of 102-wire cable, 1,400 feet of 72-wire cable, and 1,600 feet of 52-wire cable, making a total of 5,220 feet of cable. The line from central to the post is being rebuilt with cedar poles, and the wires are being renewed. The line has been renewed on West Twohig avenue to the river, and a line of big cedar poles are being put up to carry the wires in the Angelo Heights addition, west of the stream. The pine poles on the Sterling City line are being taken out and replaced with cedar. The improvements now in progress in the city will, when complete, represent an expenditure of about \$3,000. All local work will be finished by about November 15, all the material needed being on hand. There are 315 telephones now in operation on the system, and the list is growing at the rate of about ten per month.

SNYDER, TEX.—Lee Johnson has gone to Abilene to purchase material to construct a new line to parallel the Texas and Pacific Company's line between here and Colorado, and also from Colorado to Abilene, a total distance of more than 100 miles. Mr. Johnson and his associates, it is said, will also put in a local exchange here to compete with the Bell company.

MANGO HICK, VA.—Good headway is being made toward the Richmond-Aylett telephone line to this end of King William County. A short time since a line was extended from the Richmond and Aylett line from Manquin to Enfield, and thence from Enfield to Etna Mills. The line has been completed to Enfield, and the poles and cross arms have been put up to Etna Mills. The people have now organized and gone to work to put up poles from Etna Mills to Mangohick, from which point it is expected to extend it on to Hanover Courthouse.

McINDOES, VT.—The Citizens' Telephone Company is constructing a line from here to Wells River. It now has connection with St. Johnsbury and East and West Concord.

RAVENSWOOD, W. VA.—The Ravenswood Telephone Company will construct a line to Parkersburg and Spencer. L. Moore, of Roane County, is the contractor and expects to commence work immediately.

EUREKA, WIS.—The Eureka Telephone Company is extending lines from Neosho to Juneau via Hustisford. This line will connect with the Theresa Telephone Company, which is building into Rubicon from Theresa.

Miscellaneous.

TEXARKANA, ARK.—The telephone plant erected at Texarkana by the Harrison Construction Company will be opened for business November 1.

TAMPA, FLA.—The Peninsular Telephone Company now has its system in perfect working order. The company has over 1,000 subscribers, and the lines are in excellent working order.

JACKSONVILLE, ILL.—Representatives of twenty-three telephone companies, covering the Independent field in Western Illinois, met here recently to arrange for the organization of an Illinois Telephone Traffic Association, to handle the interchange of telephone traffic and promote the interest of the Independent companies. The association will cover about twelve counties in this vicinity.

MACOMB, ILL.—A new telephone line from this place to Chester will soon be completed and in operation.

STREATOR, ILL.—The Streator Independent Telephone Company has just installed a new switchboard at an outlay of \$5,000. This will now give the company room for 1,641 lines.

LAPORTE, IND.—The Laporte Telephone Company has connected its wires with the O. M. Sherman Telephone Company's switchboard.

SOUTH BEND, IND.—The Home Telephone Company is pushing arrangements as rapidly as possible toward giving South Bend subscribers service. It is expected that it will soon have 1,000 telephones in operation. Tests are being made and everything is being put in shape to render a first-class service. It is the intention of the company to furnish all patrons with free service during the month of November, no charge being made for service until December 1. It is thought that about 1,300 telephones will be in operation by that time.

SIOUX CITY, IA.—The Sioux City and Black Hills Telephone Company, which was originally organized by F. B. Rowe, who made a vigorous attempt to get a franchise in this city, now has a toll station located here. It now is possible to talk over the new line with twenty towns in Nebraska. The franchise is owned by Banker Harstad, of Ponca, who secured it on a mortgage from Mr. Rowe.

ABILENE, KAN.—The Brown Telephone Company, with headquarters here, is now giving service in Abilene, Chapman, Enterprise and Hope, where it owns exchanges, and also to thirty post-offices in Dickinson County and 200 towns in central Kansas. This company has taken over the business of C. L. Brown, and will greatly extend and increase the business. It owns over 270 miles of toll lines. The officers are: C. L. Brown, president and secretary; W. H. Teetus, vice-president; G. A. Rogers, treasurer. It has a capital stock of \$50,000.

GRAND RAPIDS, MICH.—The directors of the Citizens' Telephone Company will hold their October meeting soon.

MILAN, MO.—Members of the Browning, Humphreys and Milan Telephone Company held a meeting at Reger recently. It was decided to operate the system under two separate managements, and the company was therefore divided into two companies. One line will run from Browning to Humphreys and one from here to Humphreys. John VanFossen was elected president of the Milan-Humphrey line.

ORD, NEB.—The Independent Telephone Company here has now 160 contracts, including every one of the eighty-six subscribers to the Bell. Besides this, it has eighty-two farm contracts.

WACO, NEB.—The Independent Telephone Company is putting in farm telephones at the rate of ten a week.

COLUMBUS, NEB.—The Independent company here now has 300 subscribers, 60 of which are in the farm section. The Bell company has only a total of 150 city subscribers.

PERTH AMBOY, N. J.—The city council has laid out a route for the lines of the Hudson and Middlesex Telephone Company, which recently asked permission to construct its lines through the city. The council declared the company did not need a franchise under the State laws, and that all that was necessary was for council to prepare a route for the line.

CANAJOHARIE, N. Y.—The Glen telephone central office in Fultonville will soon be removed to this village, and consolidated with the local office.

ELMIRA, N. Y.—Efforts are being made by the Elmira stockholders to bring the general offices of the York State Telephone Company to this city. The York State Telephone Company is the corporation recently organized for the purpose of merging the different Independent telephone systems in this part of New York State and Northern Pennsylvania under one system, to eventually bring about the establishment of long-distance service between the Independent telephone companies that have been established in the various cities and small towns. W. D. Barnard, of Philadelphia, is president of the York State company, and Edward Davis, also of Philadelphia, is secretary and treasurer. It is proposed to construct a long-distance line from Elmira to Binghamton, from Elmira to Williamsport and from Binghamton to Cortland.

FRIENDSHIP, N. Y.—The Friendship Telephone Company has put in a new Kellogg switchboard, with a capacity of 100 lines. Many new subscribers have been added to their list.

FULTON, N. Y.—The Fulton Telephone Company has completed the construction of its lines between here and Phoenix, and the only break in the line between Fulton and Syracuse is now between Phoenix and Baldwinsville. This branch will be built in the near future.

GRANVILLE, N. Y.—The Granville Telephone Company has extended its line to Coila.

LYNDONVILLE, N. Y.—The Orleans County Co-Operative Telephone Company, which is constructing lines through Northern Orleans among the rural residences and connecting the smaller villages, is now established between Lyndonville and Watport.

RUSHVILLE, N. Y.—A telephone line has been constructed from Prattsburg, passing through Italy Hill and Potter Center to Rushville.

OAK RIDGE, N. C.—The new telephone line which Dr. Knight, of Haw

THE WEEK'S MESSAGES *Concluded*

River, has been building, has been put in operation. There will be an exchange at Oak Ridge.

COLLEGEVILLE, PA.—The United Telephone and Telegraph Company has recently completed a new line from Collegeville to Fairview Village, giving service to a number of patrons in that vicinity. The company is rapidly growing and extending its service into all parts of Pennsylvania, Maryland and Virginia, and now has upwards of 20,000 telephones in its system.

COUDERSPORT, PA.—The Inter-Ocean Telephone Company has its line completed between Canisteo and Ceres.

NASHVILLE, TENN.—The Cumberland Telephone and Telegraph Company has issued a statement of its business for the month of September, and growth in business is shown as follows:

Number of subscribers, September 1, 1902.....	86,223
Number added during the month.....	4,280
Number discontinued during the month.....	2,877
Net increase for the month.....	1,403

Number of subscribers September 30, 1902.....87,626

RICHMOND, VA.—The Richmond Telephone Company has begun moving into its new quarters. The company has a large force of men outting in the new telephones to the improved switchboard. Two exchanges are being operated by the company at this time, and the management is rushing things with all speed possible.

CHARLESTON, W. VA.—The Shenandoah County Telephone Company, by completing its line to Strasburg, has established communication between Staunton, Winchester, Martinsburg, Charlestown, Hagerstown, and the long-distance service.

OSHKOSH, WIS.—Contractor J. E. Mallery has gone to Milwaukee to make arrangements for material for the new telephone building.

SUPERIOR, WIS.—The People's Telephone Company has just succeeded in getting the Consolidated Telephone Company, which is composed of the two Twin City and the two head of the lake Independent companies, to give Superior one of the two through circuits from the head of the lakes to Twin Cities. Connections with Minneapolis from here are now made direct, instead of through the Duluth exchange. The local circuit, which handles the intermediate towns, connects with Duluth, but in calling Superior gets to that line through the Minneapolis end.

Personal

WILMINGTON, DEL.—Because of ill health Mr. Corke has resigned as president of the Delmarvia Telephone Company. He is succeeded by Edward H. Boughton, president of the Maryland Telephone Company.

ST. PAUL, MINN.—Through mistaken information it was announced in the issue of October 18 that C. B. Spring had been appointed traffic manager of the Twin Cities Telephone Company. Mr. Spring has no connection with this company.

NEW CASTLE, PA.—H. B. Tubbs, for over four years manager of the New Castle Telephone Company, has resigned his position, to take effect on November 1.

TRADE NOTES

THE CHICAGO PAY STATION COMPANY is ever improving its attachments for telephone pay stations. It thinks they are now as nearly perfect and ideal as it is possible to make an attachment of this sort, and equal to all the demands made on them under all sorts of service. They now are made with a coin window which shows the coin after deposit, combination locks which cannot be picked, and a rejector pocket which corrects mistakes immediately.

JAMES S. BARRON & COMPANY, New York, have put on the market an improved conduit rod. It is called the Vilard Automatic Wheeled and Wheelless Conduit Rod, and one type of it, as its name implies, is furnished with wheels. These wheels are said to lessen friction, and also to act as duct cleaners. Both styles of this rod are guaranteed not to buckle, but stay perfectly rigid when pushed. When pulled they become flexible. By no means can the rods become disconnected while in the duct, the rear end of rod having to be elevated to an angle of 45 degrees, when disconnection is effected with ease.

THE COLUMBUS STORAGE BATTERY COMPANY of Columbus, O., has just gotten out a new catalogue descriptive of its storage batteries and sundries. This catalogue is a very neat specimen of the printer's art, and shows much care and thought in its preparation. It contains a full description of all types of storage

batteries, and especially those for common battery telephone systems manufactured by the company, and also a short treatise on the use and care of storage batteries, which latter makes it doubly interesting and valuable.

THE INTERNATIONAL CORRESPONDENCE SCHOOLS of Scranton, Pa., are doing an immense amount of good in providing the industrial world with thoroughly trained and equipped graduates in all lines of business. Since this school came into existence hundreds of correspondence schools have opened up in various parts of the country—some good, some indifferent, and unfortunately a few fraudulent concerns. One of the latter has just been unmasked. It also is located in Scranton, Pa., and styled itself the Correspondence Institute of America. The post-office officials have arrested the promoters of this alleged school, and it has now developed that the "Correspondence Institute of America" consisted only of its promoters and a corps of stenographers and clerks. Not a single bona fide instructor was connected with the concern. On account of being located in the same town the bogus concern was sometimes confused with the International Correspondence Schools, and it has swindled hundreds of patrons throughout the country. There never was the slightest connection between the two, however. The International Correspondence Schools are noted for their integrity and the good they do, and have the respect and confidence of the business world.

PLANTS FOR SALE

Advertisements under this head \$1.00 for 25 words or less for each insertion. Prepaid.

FOR SALE—One of best equipped telephone exchanges in Kansas; price, \$22,000; upon which amount plant now NETS 23 per cent. If you mean business, address X for particulars, care of AMERICAN TELEPHONE JOURNAL, New York.

TELEPHONE PLANT FOR SALE—160 telephones, 100 miles of toll lines; excellent opportunity for extending business; will sell for \$12,000; pays 15 per cent. net on this amount. Address TELEPHONE CO., care of AMERICAN TELEPHONE JOURNAL.

WANTED

Advertisements under this head, 25 cents for 25 words or less for each insertion. Prepaid.

POSITION WANTED as troubleman. Fully understands line, switchboard and instrument work. Good references. Address B. L. FAYETTE, Nappanee, Indiana.

POSITION wanted as troubleman or lineman; steady work desired by young man; references given by former and present employer. Address WM. H. DIGGINS, Care Box No. 8, Woodstock, Ohio.

EXCLUSIVE handling of an account, for Chicago trade, beginning January 1st. Manufacturers Agency basis. Address SALESMAN, care AMERICAN TELEPHONE JOURNAL, Monadnock Building, Chicago.

POSITION as assistant manager of exchange of 100 or 200 subscribers, or as inspector. Best of references furnished. Address T. C. B., care AMERICAN TELEPHONE JOURNAL.

POSITION as superintendent or manager in telephone system, either on line or in exchange, by a young man of strictly temperate habits. Best of references as to character and ability. BOX 145, care AMERICAN TELEPHONE JOURNAL.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISSELL CO., Toledo, Ohio.

POSITION as wire chief in central energy exchange of from one to two thousand subscribers; 9 years' experience; best of references. A. B., care AMERICAN TELEPHONE JOURNAL, New York.

A HOME IN SOUTHERN CALIFORNIA—I desire to communicate with a man capable of taking charge of a factory for insulating rubber-covered National Code wires. This is a splendid opportunity for the right man. References given and required. No money necessary. Address P. O. BOX 1116, Los Angeles, Cal.

The American Telephone Journal

VOLUME VI

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INTER-STATE TELEPHONE ASSOCIATION*

By E. M. COLEMAN

I PRESUME this subject was assigned me because I have the honor to be the Secretary of the Inter-State Independent Telephone Association.

While I cannot enter into detail as to the facts leading up to the organization of this association, yet it is a fact conceded, not only by those interested in the Independent Telephone movement throughout the Middle States, but the Eastern and New England States recognize the fact that this association had its origin, or birth, in necessity. True, we have had in this country for some years, what is known as a National Independent Telephone Association of the United States, but for many reasons given by those interested, which I have not time to relate in this paper, interest in the National seemed to have waned, and gradually, yet certainly, the organization of another association, which would perhaps better serve the purposes of the masses of people interested in the Independent Telephone business, especially in certain States, was inaugurated. The operators, manufacturers and supply houses in Michigan, Ohio, Indiana, Kentucky, Illinois, Missouri, Iowa, Wisconsin and Minnesota, awakened to a realization of the fact that the territory in these States contained more Independent Telephone Exchanges and more toll line systems and more manufacturers and more supply houses than all the rest of the States combined. This led to the conclusion, naturally enough, that these States, naturally and geographically, and by reason of the vast amount of telephone business established, are and should be the center of the Independent telephone business, in America. In these States multiplied millions of dollars have been invested in the Independent telephone business and the best men to be found in these States—and when I say best men, I mean business men, financiers, bankers, trust company presidents, merchants, professional men and manufacturers in other lines—indeed men in every calling of life in the nine States included in this Association, have been convinced of the ultimate success of the Independent telephone movement, and have invested their money largely, pinning their faith to the experience already had in these States in the Independent telephone business. As a result of the complaints and the expressed desire of prominent operators throughout the States included in this association, manufacturers were influenced to consider the practicability and advisability of aiding in the organization of this association, so that in January, after much talk, conferences and correspondence throughout these States, the manufacturers of Chicago held a meeting and made all necessary preparation for calling a great convention and conference of men in every department of this line of business, to meet in Chicago April 9, 10 and 11, 1902. A thorough organization, looking to the preparation and entertainment for this proposed great gathering of business men was effected, and invitations were sent out all over the country, inviting the people interested to meet in Chicago on the 9, 10 and 11 of April, 1902. The manufacturers expected a hearty response, because of the events of the past, but were overwhelmed by the hearty response to their call, and on the 9th of April hundreds of men from all over these States gathered to see what was proposed to be done.

Of the hundreds gathered in the lobbies and throughout all the various hallways of the Sherman House on the 9th of April, it was interesting to witness the intense interest manifested by every man present to discover, if possible, the real intent and the real object of the meeting, and what would be the outcome of that great gathering of business men. Many had grown discontented with the outcome of similar organizations, and hence the exceeding anxiety on every man's face and in every man's action, as to what would be done on that occasion, but when the convention was finally called to order, and the temporary presiding of-

ficer announced the expressed purpose of that meeting, and the ultimate objects of its organization, every man seemed to like it, because he saw in the statement made before the convention, the possibility of a great organization, which should be organized, controlled and directed by the delegates themselves, rather than by any man, clique, or set of men.

The day has passed in this country when any man, clique, or set of men, can long hamper, control or dictate to the great masses along any channel or avenue of business activity. Every action of every man at that convention, and every expression on the floor of that convention, demonstrated to every one present conclusively that this association was going to be an organization in the interest of the people engaged in the Independent telephone business, and that the time was ripe and had already arrived, when a great organization should be established upon such lines as would best subserve the interest of every man engaged in the business, no matter whether he be largely interested financially, or simply in a small way.

The fundamental sentiment, if it can be called a sentiment, that seemed to prompt every man in the wise counsel that prevailed in that gathering, was that this association should have for its primary object the fostering of the business itself, rather than the elevation of any particular individual or business.

I do not claim to be a prophet, nor the son of a prophet, but I do predict that the Inter-State Independent Telephone Association will be the recognized organization of the kind in America! In fact, it is already thus recognized by the leading operators of this country, by the greatest manufacturing interests in the land, and by the Electrical and Telephone Journals of the United States. To illustrate what I mean, I refer you to the long editorial on page 1 of THE AMERICAN TELEPHONE JOURNAL, dated July 5th, 1902, in which a very free and full discussion is made of the National Convention, but more particularly do I refer you to the editorial comments on page 206 in THE AMERICAN TELEPHONE JOURNAL, dated October 11th, 1902, and in which the editor publishes extracts from letters he has received from various prominent telephone men throughout the Union, as to what steps shall be taken in regard to the National Association and the Inter-State Independent Telephone Association. Some suggest combination of the two, but the prevailing sentiment seems to be that the Inter-State shall absorb the National, and yet some dissent from this view, as will be indicated by the following quotations: "What would the Inter-State gain by such a consolidation? To-day it is a strong, healthy, vigorous organization, greater in every sense than the National. Consolidation between the two would only bring into the Inter-State an element that has shown its manifest incompetence by the gross mismanagement of the affairs of the National." The editor remarks, in commenting on the answers that he has received to his inquiries from the two associations, that "There are some telephone men who seem to feel that it would be an excellent thing if the Inter-State could be induced to take over the National, bag and baggage. There is quite an active majority who seem to feel that such a step would not be wholly advantageous," and so on the comments of the editor run, and quite a number of extracts from letters he has received from prominent Independent telephone men discuss matters along a similar line, but it is not within the province of this paper to discuss matters either for or against the National Association, but to show you that the Inter-State Independent Telephone Association is already recognized as the leading organization, and the active exponent of the Independent telephone business of this country. I have received within the last twelve months letters from all over this country, in which the Inter-State Independent Telephone Association is congratulated and encouraged for the unanimity and harmony of action and magnificent results that

*Paper read at Kentucky Association, Louisville, Oct. 28-29.

must follow such work as is being inaugurated by the association.

The Inter-State Independent Telephone Association is the only organization in the United States that certainly brings into close relationship manufacturers, operators, the supply houses, the large investor, the small investor, and every class engaged in the Independent telephone movement, because it embraces, as indicated above, a very large portion, or percentage, of all the Independent telephone exchanges, of all the toll line systems, of all the factories, and of all the supply houses in this country, and why should it not attract the attention of every man engaged in any channel of work in the Independent telephone movement, when the Association adopts as its creeds and bases its existence upon the following objects to be attained, viz:

1. Unity and harmony of action.
2. To keep in close touch with each other and with the manufacturers and supply houses.
3. The full and free discussion of all important questions involved in the Independent telephone movement.
4. The establishment of remunerative rates of rental.
5. The connecting of all local plants by long distance lines and the adoption of reasonable remunerative rates of tollage.
6. The adoption of such methods as will insure the best and most modern construction, and the use of only the best equipment and apparatus.
7. To establish a general bureau of information, not only for the benefit of those who have recently entered actively into the Independent telephone field, and those who in the future may engage and invest in the Independent telephone business, but for the education of the public generally.
8. To enhance the usefulness and efficiency and value of all Independent telephone property.
9. To increase the income or net revenue of each plant and toll line.
10. To adopt a system of auditing accounts between the various companies, or the establishment of a telephone clearing house.
11. To discourage building parallel toll lines or competing exchanges so that we may fight the common enemy (the Bell) and not each other.
12. To encourage and aid the building of toll lines and exchanges in undeveloped sections of territory embraced in the nine States composing this association.
13. To unite our energies and concentrate our efforts for the establishment of plants in, and toll line connections with the cities of Milwaukee, Cincinnati and Chicago.
14. To give every one engaged in the Independent telephone

business an opportunity to actively co-operate in the good work, and thus augment and enhance his own interests.

Surely every man engaged in the Independent telephone business throughout the nine States included in this association, can heartily endorse the objects set forth, as mentioned above, by this association, and can certainly get consent of his mind to seek membership and energetically enter into the work of co-operation mapped out by the Inter-State Telephone Association. Each of the nine States contains or maintains a state organization, but a state organization is not sufficiently far-reaching in its work or connections to accomplish all that is needed in the Independent movement; but by the combined efforts of the nine States, no man can foresee or foretell what great results will surely be accomplished in the next few years. I predict that the time is not far distant when every family, no matter whether in the city, town or country, in the nine States included in this association, will be blessed, or have the opportunity to be blessed, with a telephone in their home. Could anything be anticipated that would more thoroughly bless the inhabitants of these States than to make it possible that every man shall have such a convenience and necessity, luxury and comfort in his own home.

The next meeting of this association will convene at the Auditorium in Chicago, December 9, 10 and 11, 1902, and the hundreds of letters from all over these States to me, as secretary, indicate that the coming convention will be the greatest assemblage of business men ever held in America. The manufacturers and supply houses of Chicago have effected a regular organization looking to the entertainment of all who attend this convention and I know by the letters received almost daily from our Chicago friends, that the next convention will be the most handsomely entertained of any convention that has ever met in Chicago.

The officers of the Inter-State Independent Telephone Association have been ceaseless in their efforts to interest the public generally in the next meeting of this association. So thoroughly active have they been, that they have discussed the matter before their respective state conventions, and urged every man engaged in the business to take membership in the association and attend its next convention, and hence it is but fitting that, as Secretary of the Inter-State Independent Telephone Association, I urge every man, company or concern engaged in any way in the Independent telephone business in Kentucky or Southern Indiana, to attend the next meeting in Chicago on December 9, 10 and 11, and my word for it, you will then be as strong an advocate of the association and its work as any man who is now an official of this organization.

HOW THE LOUISVILLE COMPANY WAS STARTED*

By COL. HENRY L. STONE

AT the request of the officers of the Louisville Home Telephone Company, I have the pleasure of extending to you a hearty welcome to the city of Louisville. This being the first joint meeting of your associations, it is deemed quite appropriate that it be held in the largest city situated within the territory embraced by your organizations, and where you may see for yourselves the incalculable benefits that have resulted to its inhabitants from the establishment of an Independent telephone system. Here we have the most striking illustration, to be found anywhere in the United States, of what has been accomplished in new and improved methods of communication by telephone. For long, weary years the people of this city rested under an intolerable monopoly, whose service to the public was furnished at extortionate rates and in a very unsatisfactory manner. While other cities and towns throughout the country had, during the past eight years, declared their independence and thrown off the yoke of the Bell companies, it appeared that our thralldom in this respect was to continue indefinitely, with no relief in sight.

Many of our business men discouraged any movement to establish another telephone system in this city, it being argued that it was preferable to endure the ills we had and patronize a costly and indifferent means of communication with the large number of subscribers to the old system than to have established in lieu of it a new and untried system having fewer patrons with whom communication could be had, or to have the instruments of both the old and new systems installed in our business houses and

dwelling, resulting in more or less inconvenience and additional expense. It was said one telephone system, in the very nature of things, though inefficient and demanding high rates, was enough, and two would only make matters worse. This argument seemed plausible, and to most persons appeared unanswerable.

The subject was repeatedly discussed before our commercial bodies and by the public press, without reaching any definite conclusion. In this condition of things, Mr. Ellis M. Coleman, now secretary of the Louisville Home Telephone Company, having familiarized himself with the Independent telephone movement, took the lead in the effort to obtain from the city of Louisville a franchise for an Independent telephone system to run for a period of twenty years, the limit fixed in the State Constitution.

The franchise which he introduced, met with considerable opposition and delay before its final passage, which by persistent watchfulness and tact on the part of Mr. Coleman were overcome, and at last the ordinance became obligatory on November 5, 1900, without the approval of the mayor then in office.

The franchise was required to be offered for sale by the Board of Public Works to the highest and best bidder, after 20 days' advertisement in three daily newspapers, the purchase price to be paid in cash upon the approval of the sale by the general council. It brought at such sale \$10,000, the upset price.

The purchaser was required to execute within thirty days after the sale was approved, a bond to the city with good surety, in the sum of \$15,000, conditioned that he or his assignee would

*Address of welcome at Louisville Convention, Oct. 28 and 29.

within 90 days after the approval of the sale commence the work of construction, and construct and equip in the city of Louisville a first class, modern telephone plant, sufficient in character and extent to furnish to all of its inhabitants desiring the same good, first class and satisfactory telephone service, and to be completed and in successful operation within 18 months from the approval of the sale.

The purchaser is authorized to assign or transfer such franchise but not to the owner of any competing telephone system operated in the city of Louisville, and if the company owning such franchise shall at any time be consolidated with or absorbed by any competing telephone company, or if the latter shall directly or indirectly become the owner of one-half or more of the former's capital stock, or control directly or indirectly such part of its capital stock, or there shall be any combination, collusion, or co-operation between the owner of such franchise and any competing company, or their officers or stockholders, whereby the price of telephone service as fixed by said ordinance shall be in any wise increased or any of the terms or provisions of said ordinance shall be modified, changed, evaded, or nullified, then all the rights granted to the purchaser of said franchise shall be forfeited to the city, which shall have the right to take possession of all of the tangible property constituting the telephone plant and system, and to own, operate, sell or lease the same as the absolute property of the city. Such property to be treated and considered as the true amount of liquidated damages sustained by the city by reason of any such violation of the terms of said ordinance, and the measure of such damages are thus definitely to be considered as agreed upon and determined by the owner of said franchise and the city.

The telephone system thus provided for was required to be constructed under the supervision of the board of public works and laid in conduits or other underground structures within a large area in the central part of the city. No poles were allowed within such area, except such as might be necessary in the interior of squares for the distribution of wires to subscribers for telephone service. Outside of said area wires are permitted on poles, located wherever practicable in alleys instead of principal streets, the right of the city to extend the underground area being expressly reserved.

The owner of said franchise was required in the construction of conduits to furnish at least one duct sufficient for the use of the city in laying therein the wires of its fire alarm and police patrol systems, which shall be for the exclusive use of the city for said purposes. The owner of said franchise is also required to provide space on its poles for carrying such wires of the city, the same to be placed as well as those in conduits for the fire alarm and police patrol systems, without charge except for material, which is to be furnished at the cost of the city.

The rates to be charged are not to exceed the following schedule:

For each business telephone one individual wire with metallic circuit, wherever located within the city limits, \$48 per year;

For each residence telephone on such wire with such circuit, within a radius of one mile from the court house, \$24 per year;

For same within a radius of two miles of the court house, and exceeding one mile therefrom, \$30 per year;

For same within the limits of the city, and outside of a radius of two miles from the court house, \$36 per year;

On extension desk telephones the rate shall not exceed \$12 per year and for installing extension bells \$5 each.

There shall be no charge in addition to the foregoing rates for the use of telephones or instruments of the owner of said franchise for communicating to and from points within the city and no pay stations for the communication of messages in the city; but public pay stations may be established at hotels and railroad stations for the benefit of the traveling public.

All lines are required to be attached to long distance instruments, and there shall be no party lines constructed or maintained by the company operating said telephone system.

When the owner shall have in use 6,000 instruments furnishing telephone service to that many persons, firms, or corporations, then such owner shall pay to the city, in addition to all municipal taxes, \$1 per annum for every such additional telephone service or instrument in excess of 6,000.

The apparatus, instruments, switchboards, appliances, and equipment of said telephone system are required to be of the best, most modern and approved central energy type, and all switchboards must be of the multiple form, except in sub-exchanges, and are to be maintained during the existence of said

franchise with the best equipment possible, and the telephone service shall be first class in all respects, and continuous and unlimited for twenty-four hours in every day during the entire period of twenty years, for which said franchise is granted, except in case of interruptions from unavoidable causes.

The owner of said franchise is required to furnish the city free of charge twelve telephones in such public offices as shall be designated by resolution of the general council, and any additional telephones furnished to the city are to be at a rate 25 per cent. less than the charge upon other business telephones.

The company owning and operating said franchises shall connect the lines of its system as far as possible with lines outside the city in this State on reasonable terms without discrimination, provided the owners of such outside lines desiring and applying for such connection shall agree to receive and transmit on like terms all messages in which the owner of said franchise may be interested. In case of disagreement between the owner of said franchise and the owner of any outside line as to the terms and conditions upon which such connection shall be made, so as to hinder or delay the same, such disagreement shall be promptly submitted to an arbitration committee composed of three freeholders and voters of this State, one to be chosen by the owner of said franchise, one by the owner of the outside line, with which the connection is desired to be made, and the third by the mayor of the city of Louisville, and the decision of the majority of said committee as to the terms and conditions upon which such connection ought to be made, shall be final and conclusive upon all the parties.

As an additional security for the performance of the conditions and stipulations contained in said ordinance, the owner of said franchise was required to execute a separate bond, with sufficient surety, in the sum of \$10,000 payable to the city, specially conditioned for the indemnification of the city against all loss or damage sustained by any person, firm, or corporation by reason or growing out of the construction, repair, or operation of said telephone plant and system, and also conditioned that the city shall be saved harmless from the payment of any sum to any person, firm, or corporation on account of any act or omission of the company operating said telephone plant or system, its agents, officers, or employees, either in the construction or operation of said plant or system, or on account of the payment of any judgment which may be rendered against the city in any action based on any such act or omission, which bond shall be renewed every five years with sufficient surety, each bond to be in force and effect until the bond in renewal thereof shall be approved by the general council, which may require such bond to be renewed oftener or at any other time when it deems the surety insufficient, or when such bond shall become impaired by reason of judgments, claims or otherwise.

Finally, said ordinance expressly provides that the franchise thus granted shall not be exclusive nor prevent the general council from providing for the sale of similar franchises or privileges to other persons, companies or corporations.

The Louisville Home Telephone Company, having become the owner of the franchise provided for in said ordinance, began its work of construction in May, 1901, and, after some unavoidable delays, completed its system in about fourteen months thereafter. Since August 1, 1902, it has been in successful operation.

I am reliably informed that it is now rendering service to 5,000 patrons, has contracts for the installation of 1,400 additional instruments, and is receiving applications for more running from 70 to 100 per week. Its public service is eminently satisfactory to its patrons, all of whom are grateful for the new order of things. The rates fixed by said ordinance and charged by the Home Company are only about one-half of those formerly imposed upon our people by the Bell Company. Indeed, the \$36 rate per year for residence telephones in the city, outside of the radius of two miles from the court house, is not charged as it lawfully might be by the Home Company, but the highest rate for a residence telephone anywhere within the limits of the city, however, remote from the court house, is only \$30 per year.

The switchboard of the Home Company in this city is up-to-date in all respects, and evidences the marvelous perfection reached by human ingenuity and invention in electrical appliances for the equipment of a modern telephone system. This switchboard, I am informed, with its capacity for 12,600 metallic circuits, is the largest ever erected in the world.

The Independent telephone movement, as you are aware, began in the smaller cities and towns, but within the last few years most of our large cities have taken advantage of the better and

more economical service furnished by Independent telephone companies. To-day in the central part of the United States, I understand the Independent exchanges outnumber those of the Bell companies in the proportion of at least 4 to 1. In Kentucky it is claimed the Independent companies have over 100 exchanges, while the Bell companies have not exceeding 25. This development of the Independents in this State has been made mostly within the last four years. Owensboro was the first city of any size in Kentucky to lead in this Independent movement. In the blue grass region the Independent telephone exchanges now largely predominate. When Mr. Coleman made his successful fight for Independent telephone service in the city of Louisville, the metropolis of this State, and the business center of the territory covered by your associations, a great victory was won for the cause of telephone independence. The Independent exchanges in all the smaller cities and towns of Southern Indiana

and of this State are rapidly being connected with the exchange of the Home Company in this City.

Furthermore, Independent long distance trunk lines extending in all directions from this city to nearly all the large and important cities in the United States, are being constructed and connected for the use of the public.

These inestimable advantages to the city of Louisville and the patrons of the exchanges you represent, are as yet but partially realized and appreciated; but the great benefits already derived and those which will be received in the near future by them will certainly place them under lasting obligations to the members of your associations and all those public spirited citizens, throughout the country, who so courageously inaugurated and are still so triumphantly engaged in carrying on the beneficent work of establishing and furnishing economical efficient and satisfactory telephone service to the American people.

KENTUCKY AND SOUTHERN INDIANA CONVENTIONS

A JOINT convention of more than ordinary interest and importance to Independent telephone interests, was held in Louisville, Kentucky, on October 28 and 29. This was the yearly meetings of the Kentucky Independent Telephone Association and the Southern Indiana Independent Telephone Association, it being the fourth annual convention of the former and the third annual of the latter. The Board of Trade Building served as the convention hall, and joint headquarters were at the Louisville Hotel.

On Tuesday, the 28th, at 2 o'clock, the joint meeting was called to order by R. V. Bishop, of Cynthiana, Ky., the president of the Kentucky Association. He introduced Hon. Henry L. Stone, city attorney of Louisville. Mr. Stone delivered the address of welcome which will be found on another page.

W. C. P. Breckenridge was scheduled on the regular program for a response in behalf of the Kentucky Association, but in his absence H. K. Cole, of Lancaster, vice-president of the association, was assigned that honor. Mr. Cole warmly thanked the people of Louisville through Mr. Stone for their welcome. He said that he and his fellow Independents had come to Louisville peacefully inclined, and that they had left their "troublemen" at home. They deeply appreciated their cordial reception.

G. A. Keinle, president of the Southern Indiana Association also briefly responded to the address of welcome as follows:

In response to the hearty welcome that has been extended to us by Col. Stone, representing the mayor of Louisville, I state, for the Indiana delegation, that we are more than glad to have the opportunity to meet in your midst. When we were thinking about a meeting place we had selected Evansville for a place of meeting for the Indiana Independent Telephone Association, we thought Evansville needed a stimulus on the part of the Independent telephone people, to show them that we are actively engaged, not only locally in our own localities, but actively engaged to spread the wires of the Independent telephone system all over this great Union and to ask the city of Evansville to get in line and establish an Independent telephone exchange. But when the temptation was held out to us to come to Louisville we could not withstand, knowing the hospitality of the Kentuckians, knowing the fair women, knowing the good things—I don't want to say whiskey—and knowing everything else that is said about Kentucky that is good, we thought it would be well for Indianians to come and meet with their Kentucky neighbors.

Indiana and Kentucky are sister States; sister States not only in the broad sense of the word, but in a limited sense also. We are one because we have been brought together by a common cause and a common foe. The cause that we have espoused as our cause is the cause of the common people of the United States, who should at all times have an opportunity to make use of the grand achievements of modern science and invention, which the Bell telephone people have withheld from the common man and the poor man; and the Independent telephone men who are here to-day have brought it about that even the poor man can enjoy the luxury of having a telephone in his home to communicate with his neighbor and with the business man. And not only in his locality but the long distance men are in our midst who will tell you that one city is being

linked and joined to the other, so that we can all communicate with one another. Our interests are common. You know that we do not represent capital. There is not a company here, except, perhaps, the Louisville Home Telephone Company, that represents a large amount of capital. And even if the capital that we represent should run into the hundreds and thousands of dollars, it is not one man that has taken his money and put it into a business interest in order to reap a large and a grand harvest. The small man has had an opportunity to take the stock, and if there is any enrichment to be gotten from telephone interests, the poor man's share is in the profit of the business in the Independent telephone field; whereas in the Bell telephone business the company only are enriched by the profits.

S. P. Sheerin made a talk as to the patent litigation being carried on by the National Association, and asked that the Kentucky Association contribute \$1,000 to this cause and that the Southern Indiana Association raise \$2,000.

On motion, Mr. Bishop appointed D. L. Prewitt, Jas. S. Brailey, Jr., and John A. Armstrong a committee to plan the assessment and report at the next day's session.

H. K. Cole, of the Kentucky Association, read a paper on "Long Distance Toll Lines and Connections," which was a very comprehensive treatise on this subject. His paper was supplemented by a report from Jas. S. Brailey, Jr., who has charge of the Independent long distance system being constructed out of Louisville. Mr. Brailey reported that long distance connections with Lexington, Frankfort and the entire Blue Grass section would be in operation by the end of that week. Long distance connections have already been made to Elizabethtown and the southern part of the State. The lines to Owensboro, Henderson and Western Kentucky, he stated, would be in operation in a very short time.

A paper which undoubtedly made a deep and lasting impression on the delegates was that read by E. M. Coleman, secretary of the Louisville Home Telephone Company, on the Inter-State Association. Mr. Coleman's paper which appears on another page, was heard by the delegates with enthusiasm.

Two papers, "The Bell People as Antagonists" by A. J. Payton, of Lockport, Indiana, and "Franchises" by John R. Allen, of Lexington, Kentucky, were next on the program, but in the absence of these gentlemen, were not delivered.

At the conclusion of his paper, Mr. Coleman announced that the delegates would be entertained that evening as the guests of the Louisville Home Telephone Company, at a "smoker." The "smoker" was a unique function, and was a great success. When the guests had assembled, President Bishop announced that the affair would be conducted on the same lines as a Methodist class meeting, and that every person called on would be compelled to respond with a story. Mr. Coleman, who is also secretary of the Inter-State Association, reiterated this, and remarked that should a man not respond with a story when called upon, he would either be shot or the hose turned on him. And worse still, the culprit would be refused entrance to the "Golden Gate," by which was meant the banquet hall, where a rich spread was afterward served in true Southern style. As a result of these dire threats, everyone racked his brain for an anecdote or reminiscence. Among the particularly witty and interesting story

tellers were G. A. Keinle, R. V. Bishop, D. L. Pendleton, Ed. L. Barber, James S. Brailey, Jr., J. E. Zeluff, H. K. Cole, James Maret, E. W. Pickhardt, Desha Breckenridge, David Bush, R. E. Ashbrook, Jacob Zinsmeister, and many others of equal ability.

President Bishop called the convention to order on the second day at 9.30 o'clock. James S. Brailey, Jr., read a paper on "Merging of Independent Telephone Plants." He said that the companies should not consider their own service more than the service of their neighbors, and that they were mutually dependent on each other. Mr. Brailey concluded with a prophesy that it would be only a question of a short time until the Independent companies are merged into district, state and national organizations.

A. L. Têtu, of Louisville, then read a good practical paper on "Operating and Governing Telephones Plants."

A paper on "Rates" was next read by D. L. Pendleton, of Winchester, Kentucky. This paper was printed in the AMERICAN TELEPHONE JOURNAL of last week. Mr. Pendleton is a lawyer, and has given the telephone situation much consideration. His paper went very thoroughly into the subject of rates—a question that has given the Independents much trouble.

"Our Relation Towards the National Association," was the subject of a paper prepared and read by president G. A. Keinle, of the Southern Indiana Association. From 11.30 to 2.30 p. m., the meeting adjourned, and the delegates in a body inspected the plant of the Home Telephone Company, which ranks among the finest and most complete in this country, if not in the world.

When the convention reassembled, various committees were appointed.

Statements of the conditions of their respective associations were given by presidents Bishop and Keinle.

The committee appointed to determine the assessment for patent litigation reported in favor of contributing a little over \$500.

The election of officers for the two associations for the ensuing year was next taken up. John A. Armstrong, of Louisville, was nominated for president of the Kentucky Association, but declined, arguing that it was best to select someone from out in the State. D. L. Pendleton was then nominated and elected. H. K. Cole, Lancaster; and James Maret, secretary and treasurer respectively of the Kentucky Association were unanimously re-elected.

The old officers of the Indiana Association were re-elected, standing as follows: G. A. Keinle, Huntingburg, president; C. D. Knofel, New Albany, vice-president; E. W. Pichardt, Huntingburg, secretary; and T. M. Thorn, Lamar, treasurer.

After disposing of accumulated routine business, the joint convention was declared adjourned.

On this evening, another entertainment feature had been planned for the delegates. James S. Clark, Jr., of the James Clark Company tendered a banquet at Fountain Ferry Park. The firm conveyed delegates to the point in chartered cars, and entertained them in a royal good fashion.

KENTUCKY COMPANIES REPRESENTED.

The Independent telephone companies in the following Kentucky cities were represented at the joint convention:

Frankfort,	Lancaster,
Georgetown,	Mt. Vernon,
Lexington,	Henderson,
Versailles,	Brandenburg,
Cynthiana,	Winchester,
London,	Mt. Sterling,
Hartford,	Madisonville,
Cave City,	Morganfield,
Campbellsville,	Fordsville,
Carrollton,	Columbia,
Owensboro,	Lawrenceburg,
Owenton,	Nicholasville,
Elizabethtown,	Maysville,
Paris,	Paducah.

INDIANA COMPANIES REPRESENTED.

Indiana Independent companies in the following cities were represented:

New Albany,
Salem,
Scottsburg,
Seymour,
Huntingburg,
Bedford,
Henryville,
Sellersburg,

Brownstown,
Crothersville,
Orleans,
Evansville,
Rockfort,
Columbus,
North Vernon.

OPERATORS PRESENT.

There were nearly 150 delegates present, the following being a partial list:

R. V. Bishop, Cynthiana, Kentucky,
G. A. Keinle, Huntingburg, Indiana.
James S. Brailey, Jr., Toledo, Ohio.
H. K. Cole, Lancaster, Kentucky.
C. D. Knofel, New Albany, Indiana.
James Maret, Mt. Vernon, Kentucky.
E. W. Pichardt, Huntingburg, Indiana.
D. L. Pendleton, Winchester, Kentucky.
T. M. Thorn, Lamar, Indiana.
S. P. Sheerin, Indianapolis, Indiana,
E. M. Coleman, Louisville, Kentucky.
Ed. L. Barber, Wauseon, Ohio.
A. L. Têtu, Louisville, Kentucky.
J. E. Zeluff, Louisville, Kentucky.
G. V. Murray, Campbellsville, Kentucky.
Nerge Clark, Bowling Green, Kentucky.
David L. Prewitt, Pine Grove, Kentucky.
F. J. Beaucond, New Albany, Indiana.
R. E. Ashbrook, Paducah, Kentucky.
E. W. Ford, Hartford, Kentucky.
Thomas J. Landrum, Louisville, Kentucky.
James A. Armstrong, Louisville, Kentucky.
Desha Breckenridge, Lexington, Kentucky.
David Bush, Winchester, Kentucky.
Jacob Zinsmeister, New Albany, Indiana.

MANUFACTURING AND SUPPLY REPRESENTATIVES.

There were quite a number of manufacturing and supply houses represented at the convention, and several of them had exhibits in the Louisville Hotel. Among those present were:

W. R. Hauptman, American Electric Telephone Company.
A. Barker, Kellogg Switchboard and Supply Company.
F. L. Martin, Kellogg Switchboard and Supply Company.
Ray H. Manson, Kellogg Switchboard and Supply Company.
G. H. Lutz, Kellogg Switchboard and Supply Company.
R. Brinck Tyler, Stromberg-Carlson Telephone Manufacturing Company.
W. T. Heddon, Stromberg-Carlson Telephone Manufacturing Company.

SPELLBINDING BY TELEPHONE

"GREENBACK" WILLIAMS, as he is known in Cloud County, Kan, last night defied the elements and filled an engagement to expound the doctrine of Peter Cooper under great difficulty, says a Topeka, Kas., dispatch to the New York Sun. Williams is the only Greenbacker in Kansas, and it is his custom on the Saturday night before election to address his fellow citizens at Glasco.

Williams lives on an island in the Solomon River. Heavy rains Friday washed away the bridge spanning the river between his place and the village, and when Saturday night came he could not leave his island home to address his fellow citizens assembled two miles away. But Williams was not to be silenced. Stepping to his telephone, he had his line connected with the town hall. Then when the crowd assembled Williams made his speech, which was repeated, sentence for sentence, to the audience by a young man in the town hall.

ANTI-MATRIMONIAL REGULATION

THE manager of the Williamsport Telephone Company at Williamsport, Pa., requires all unmarried young women securing employment at the exchange to sign an agreement not to marry in three years. He claims that the enforcement of this restriction is the only way in which he can keep good help, for otherwise, about the time a girl becomes expert, she marries.

IN THE OPERATING FIELD

UNITED STATES TELEPHONE COMPANY

PLANs are being prepared for increasing the operations of the United States Telephone Company which will materially better its service. The *Cleveland Press* says regarding the plans:

Negotiations for the sale of 20 per cent. of the stock of the United States Telephone Company to E. L. Barber and his associates probably will be concluded, this week. The sales of the stock and the new money that will be provided for the extensions of the United States Company will nearly double its earning capacity and make it a phenomenal money maker.

The United States Company now has \$1,865,000 of stock out, the company being owned entirely by the Federal Telephone Company. There will be \$400,000 of the stock to the Barber syndicate at 25. This will give \$100,000 money for the Federal that will be at once turned back to the United States Company for enlargements. The United States Company will then enlarge its capital \$250,000, and the new stock will be sold at once at 25 to Mr. Barber and the other holders pro rata and the combined fund will be at once applied to enlarge the United States Company and make needed extensions through Southern Ohio, West Virginia and Indiana. The managers of the company claim that at a comparatively small cost they will practically double the earning power of the company.

The financial changes will enable the United States Company to pay, in December, the interest which was due on its bonds, last July, and meet its January bond interest on time.

The control of the United States Company will be lodged in three voting trustees for five years. R. A. Harman and J. R. Nutt will represent the Everett-Moore syndicate and the third will be named by Mr. Barber.

A BELL LICENSEE NOW AN INDEPENDENT

THE Argenta Telephone Company, of Argenta, Ill., was a small Bell lessee, organized to furnish service to the town, and renting instruments from the Bell. It is now announced from Argenta that three local citizens, S. Gerber, P. E. Gerber and S. O. Hilbrant, have purchased the plant, and will run it as an Independent company. O. E. Duddlestone will act as manager.

The new owners have taken out the Bell telephones and replaced them with instruments purchased of the Macon County Telephone Company. The Argenta exchange now receives toll service from the Macon County Company. The latter owns the wires from Decatur to Oreana and the terminal at that place. It has connected with the Argenta line at Oreana. It will also connect with the Argenta line at its terminal near Cisco, and thus make a toll line through to Cisco, to connect with an exchange which will soon be installed in that village by the Macon county people.

MICHIGAN TELEPHONE AFFAIRS

DICKINSON, Stevenson, Cullen, Warren & Butzel have filed a bill in the United States circuit court, to foreclose mortgages of the Michigan Telephone Company. The suit is brought in default of the last semi-annual interest. The aggregate of the mortgages is \$5,000,000.

The law firm has not filed a bill for the foreclosure and sale of all the properties of the telephone company for the whole debt, but only for the defaulted interest. The mortgages are for 5 per cent.

The first mortgage—there are supplemental ones also—was filed July, and is for \$750,000.

Asked if the suit would interfere with the company's regular business, Don M. Dickinson said that it would not, unless a receiver were appointed, but made it clear that such a course was not determined on at present. Dickinson, Stevenson, Cullen, Warren & Butzel represent the Old Colony Trust Company, of Boston.

The mortgages are due variously, one for \$750,000, falling due July, 1907, on which \$259,000 in bonds and principal are out.

Several schedules are filed. As far back as 1899 the company's assets were fixed at \$1,404,809.26. Detroit's list of subscribers is set down at \$280,027.76; Grand Rapids, \$131,269.15.

Total construction is set down at \$776,166.30; total real estate, \$93,555.62; material on hand, \$350,443.86; metallic construction, \$184,613.48.

In 1900 the company acquired still additional property, valued at \$972,019.79. In this schedule, Detroit is represented at \$144,244.97, for new subscribers; metallic state line, \$268,355.21; real estate, \$68,649.85; increase in material, \$198,550.88.

Section 9 says that, in addition to the above schedules, there are still other assets, in connection with the general telephone business in various towns and cities throughout the State.

The defendant is asked to disclose fully a more detailed description of assets, of any and every kind. These are said to include such items as real estate contracts, rights, titles, franchise interests, privileges, choses in action, patents, easements, patent rights, titles, and licenses; also the relation of these interests to the general telephone property.

The bond issues under the trust mortgage are gold-bearing of \$1,000 each, interest payable July and January. Under the mortgage, \$4,715,000, have been executed by the company. The other \$285,000 are deposited with the Old Colony Trust Company to meet at maturity the general purposes of the mortgage.

The bill is filed in behalf of bondholders whose interests aggregate \$4,000,000.

A FREAK OF LIGHTNING

MANAGER TARTE of the Citizens' Telephone Company has a curiosity in the shape of burnt out wires, which he intends to preserve as a specimen of the freak work of lightning, says the Grand Rapids, Mich., *Press*. The fierce electric storm which passed over Grand Rapids a week ago Sunday night, burned out some of the company's cables on the West Side, but it did not begin to have the effect here which it did on the lines around Grattan. Wires were burnt out and rendered useless generally in this region, but the most peculiar trick the lightning played was in completely destroying every vestige of wire, and leaving the insulating material in a tattered and torn condition, yet still in some kind of tangible shape.

In one piece of covering twelve feet in length, not an inch of wire was found. For a lot of twenty-five spans which means about three-quarters of a mile of wire, some ten small pieces, aggregating about two feet, was all that remained to show the covering had ever contained the standard No. 18 copper wire which is used in telephone lines. Mr. Tarte regards this as the strangest freak of the lightning's work he has ever known.

SUSQUEHANNA TELEPHONE COMPANY

ABOUT two years ago the Susquehanna Telephone Company, of Susquehanna, Pa., was organized with a capital stock of \$5,000. About \$2,000 of this stock was paid in. The stock paid in was about sufficient to purchase the line from the party constructing it, but was not sufficient to extend it to meet the demand for telephones. This deficiency in the capital, required to extend the line to meet the demands of the public, has been made up, however, by assessments upon stockholders and not by the further sale of stock.

The company has furnished excellent service. It has adopted the best instruments made; has used in the construction of its lines the best copper wire, and with the aid of obliging operators has furnished telephone service equal to the best. The rates charged by the company are \$1.25 per month for business places and \$1.00 per month for residences. The demand for telephones has been such that the company has been obliged to delay installing while waiting for instruments. Notwithstanding the small rental charged, the annual statement of the company sent to the stockholders shows a surplus invested in the line of \$1,881. The face value of the stock of the company is \$10 per share.

Since organization three assessments have been made, amounting in all to \$7 per share; making the total cost of each share \$17. The stock to-day, basing its value upon the assets of the company, is worth \$19.60 per share, or \$2.60 more than its cost to the stockholders, and in addition to this the stockholders have had the use of their telephones for two years. The revenues of the company have been more than sufficient to maintain it and the as-

IN THE OPERATING FIELD

assessments paid by stockholders have been invested in improvements and extensions. The company holds a permanent agreement with the local lines in Southern New York and a five year contract with the Northeastern Telephone Company.

Its renters and stockholders have free service of line reaching to the following and intermediate towns: Starrucca, Thompson, Forest City, New Milford, Montrose, Windsor, Afton, Deposit and Bainbridge. At the present time there are over 160 telephones on their lines, connecting nearly all the hotels and business places, the railroad dispatchers and telegraph offices, the D. & H. railroad station, livery stables, doctors, lawyers, newspaper offices and a large number of dwelling houses. A nominal charge of 5c. is the public rate for local messages, which may be sent from any telephone on the line, and 10c. and 15c. for messages to other towns, including Montrose.

The company is managed by a competent board of directors, composed of local business men and is in a highly prosperous condition.

CABLE ACROSS MISSISSIPPI RIVER

A TELEPHONE cable has been laid across the Mississippi River from West Chester, Mo., to Chester, Ill. This cable designed to furnish means of communication from the various points in Illinois to the several towns in Missouri. It was laid by the Gordon Telephone Company, of Chester, Ill.; Wm. J. Hartman, owner of the Kaskaskia system and the Ste. Genevieve Telephone Company. The cable is constructed after the regular standard specification of submarine cables; it is 2,000 feet long, weighs 4,000 pounds. It was placed upon a reel, on a barge, and towed by boat across the river, being allowed to unwrap and sink to the bottom as the boat moved across.

This cable forms a connection through the Gordon Telephone Company of Chester to the various systems in Illinois, through the Ste. Genevieve Telephone Company and Wm. Hartman to the various companies in Missouri, with which they are connected. The Perry County Telephone Company has not yet the right to pass its messages across the river, but will possibly in the near future make arrangements for doing so.

INTERSTATE COMPANY WINS

AMONG the decisions handed down by the Illinois Supreme Court recently was one of very great importance in electric circles in Illinois. The decision of the Appellate Court in the famous telephone case was affirmed. This is a sweeping victory for the Northwestern, now Interstate Telephone Company, of Aurora.

The case has been watched by electric companies with much interest as it involved entirely new law. When the litigation was first started, there had not been a single decision in an Illinois court of record covering the points at issue.

When the Northwestern Telephone Company invaded the Aurora field which the Chicago Telephone Company had long considered its own, there was trouble at once. The old company obtained an injunction restraining the new company from paralleling its lines on any street in Aurora and from overbuilding or underbuilding its wires and the circuit court made this injunction permanent.

If this position could have been maintained it would have given the old company a practical monopoly of the streets of Aurora and would have made it impossible for Independent lines to make much headway against the established companies operating under Bell patents. The fight was therefore to a finish.

Able counsel was employed by both sides and the case was fought out in all the courts. The result is a sweeping victory for the Interstate Company and settles the matter for all time.

ANGLO-BELGIAN TELEPHONE

REGARDING the telephone service between London and Belgium, the following letter from G. W. Roosevelt, consul at Brussels, under date of September 11, to the State Department, may be of interest:

The Anglo-Belgian telephone service will be inaugurated in about two months. The submarine cable stations are located at

St. Margaret's Bay, near Dover, and at La Panne, a Belgian seaside resort. The work of laying the cable is completed, and the company is now placing the aerial extensions in both England and Belgium. The cable is 90 kilometers (55.422 miles) in length and has two circuits. The total cost when completed will be about 2,000,000 francs (\$386,000), to be shared equally by England and Belgium. Belgium will communicate with England from the cities of Brussels and Antwerp only. If communications are numerous and the new line is profitable to the Government, the service will be extended to other cities. The rate of communication has been fixed at 10 francs (\$1.93) for three minutes.

ENGLAND'S BELL COMPANY

AS for the National Telephone Company, it deserves much pity and more blame. The difficulties with which it has had to contend have never been even faintly appreciated by the public, and the immense value of its pioneering work has been ignored. On the other hand its faults have been patent. It has never yet made a concession in the right way or at the right time, it has displayed most of the vices of the monopolist and few of his virtues, it has maintained an unsympathetic, not to say domineering, attitude, towards its subscribers, and it has succeeded in putting up the backs of the local authorities. Small wonder that it stinks in the nostrils of the man in the street, or that municipalities seek to establish competitive services in the hope of mending or ending the present regime. It is significant that such mercantile communities as the local Chambers of Commerce, usually the champions of individual as opposed to municipal enterprise, are among the loudest in clamoring for municipal telephones, preferring to sacrifice their traditional principles rather than submit to another eight years of unqualified dependence on the National Telephone Company.—*London Electrical Times*.

FARM LINE DEVELOPMENT

THE daily press has of late been devoting much time and space telling us of the telephone on the farm. It is clear to any one who gives a moment's thought to the subject that there is a crying need for farmers to have some quick means of communicating with their fellows. They are shut up in their own little worlds, miles of farm lands intervening between their nearest neighbors and the dwellers in the cities and towns. They want to see and talk to their fellow farmers, and they have business dealings of vital importance to their daily lives, with the tradesmen and business men in the towns and cities. It is clear, therefore, that some quick means of communication that will save a weary journey by horse and wagon is almost an absolute necessity to the farmer.

Since they have learned of the comparative cheapness of a telephone service, and that it suits their wants better than any other known device, there has been a wonderful growth of farmer lines—both those built on the co-operative plan by the farmers themselves and those lines built by the Independent companies running from their exchanges in the towns out into the rural districts, and supplying the farmers with service.

While it is true that the way the farmers have taken to the telephone is astounding, it is equally true that a very extensive field yet remains to be developed. The daily newspapers tell us that practically all the farm houses in the country districts have telephone service. However, this is slightly exaggerated. The census of 1900 showed that there are over 5,700,000 farms in this country. When one considers that in the United States, counting both Bell and Independent services, there are only 3,500,000 telephones in actual use, it can readily be seen that practically every farm house does not have a telephone. And of this 3,500,000 telephones there are only about 200,000 or less that are in use in the rural communities or, in other words, about 3½ per cent. of the farms of the country have telephones.

It can be seen from this showing that the telephone companies and the telephone manufacturers need have no fear from the misleading reports of the daily papers that the farms have been developed to their fullest extent. There yet remains an enormous field to be worked and developed.

Opinion and Comment

TELEGRAMS BY TELEPHONE

SOME old friends of the telegraph, more particularly in Europe than in this country, look upon the telephone as being principally useful as an aid to the telegraph—a sort of feeder and distributor of telegraphic traffic. In several European countries quite a feature is made of this use of the telephone, many telephone subscribers sending and receiving all their telegrams by telephone, the message being telephoned, however, only between the local telegraph office and the subscriber's station. Although the telephone is thus largely availed of as a time-saver, there is still a curious prejudice in many minds against telephoning telegrams *all the way*, without any intervention of the telegraph with its record—that supposedly holy talisman against errors in transmission. Considering the enormous amount of important business that is daily transmitted by telephone, without an appreciable percentage of error and at an immeasurably greater speed than that of the telegraph, it is remarkable that this unreasonable prejudice against telephoning written messages should still obtain in circles where there is sufficient common sense to use either the telegraph or telephone at all.

That it does still exist, however, is indisputable. No doubt this is largely due to the fact that the telephone companies, having had so far as much as they can do to attend to their immediate business of supplying telephone service pure and simple, have not yet taken any steps to cultivate a profitable field that lies ready to their hands, the transmission and delivery of local telegrams. In every large town there is plenty of demand for a cheap telegraph service, and the telephone company has just the plant and organization to furnish such a service. It will yet be many years before every man with whom occasional quick communication is desired by someone else has his own telegraph station in his own place, in the form of a telephone. Meanwhile the telephone company has its wires and stations, public and private, in all directions, its messenger force and its supervisory force, all the machinery, in short, with which to organize in a few days a rapid, efficient and cheap local telegraph service. At, say, 10 cents a message of twenty words of text, such a service would be profitable to the telephone company and would meet with a ready demand from the public.

In another column a description is given of the adaptation of telephone exchange methods to the working of the several hundred local telegraph offices in London. Hitherto all traffic between these offices has had to be re-transmitted at the main office. Now all the offices are to be connected to a central energy switch-board and are to be connected to each other and disconnected on signals in exactly the same way as telephone stations, the only difference being that all the talking is to be done by telegraph. Our collaborator *The Arrester* very pertinently asks, why not turn the telegraph offices into telephone stations and be done with it? This would obviously give a quicker and a cheaper service. However, such a change would no doubt be too radical a departure for a government department to indulge in, in spite of its obvious advantages. But the local telephone company has the whole outfit complete, the stations all over the city and the switch-board for promptly connecting any two together, while in its own organization any well-managed telephone company has available

the necessary skill for organizing the service of transmission and delivery and for working out the details incident to a new service.

Some time ago we endeavored, without much success, to arouse some discussion on the question of aids to the revenue of a local telephone system. In this business of transmitting local telegrams there is a valuable "by-product," as it were, lying ready to the hand of the manager of every large telephone system. Such a service would utilize the plant when it would otherwise be idle, would bring in a revenue that otherwise would not be earned at all, would add to the popularity of the telephone by the display of enterprise it would make, and would form a constant advertisement of the telephone service proper. As the telegrams would go largely to non-subscribers the message forms and envelopes would carry an advertisement of the telephone service directly to the point where it would do the most good. Smartness and efficiency would be highly necessary in the service, especially in the delivery service, but most telephone managers are keenly alive to the necessity of smartness and efficiency in carrying out any work they undertake.

Finally, a word on the vexed question of accuracy of transmission. By the adoption of a proper method it is a simple matter to ensure absolute accuracy in the transmission of written messages by telephone. There are numerous groups of words that sound much alike by telephone when the transmission is poor and the speaker's voice indistinct. For example: "Tell Tom to meet me at Eleventh street at nine," might easily be turned into "Tell John to meet me at Seventh street at five." But if the message is dictated in this way: "T-e-l-l, tell, T-o-m, Tom, t-o, to, m-e-e-t, meet, m-e, me, a-t, at, e-l-e-v-e-n-t-h, eleventh, s-t-r-e-e-t, street, a-t, at, n-i-n-e, nine," there is no possibility of error, except through the grossest carelessness, and no method can guard always against the occasional pure stupidity and carelessness of mankind. Otherwise there would never be any errors in telegrams, or accidents on railroads, or other disasters, large or small. The transmission letter by letter is a trifle slower than reading the words straight off, but the net result is quicker, as repetitions and questions are avoided, and absolute accuracy is ensured.

OPTICAL TELEPHONY

OUR readers will no doubt be glad of the authoritative information contained in the department of "Foreign Currents" on the recent experiments of Herr Ernst Ruhmer in telephoning by means of an arc lamp and a selenium cell. Accounts of these experiments, in more or less exaggerated form, have been cabled to the daily papers of this country in such language as to convey the impression that commercial wireless telephony was within sight. The details of the experiments show that this is far from the actual facts. A telephone system requiring at each end an arc lamp consuming about a horse-power of energy and a delicate selenium cell, together with large parabolic reflectors and other paraphernalia, looks like rather an expensive and complicated installation for communication at a distance of five miles. Such a system may have application for military signalling, where cost is of no account, but it is clearly not commercial. Nor is optical telephony ever likely to be commercial, as the cost of the apparatus increases out of proportion to the increased distance of signalling, and the range of transmission is limited by the fact that the rays of the transmitting arc must fall directly on the receiver. Hertz waves evidently follow the curvature of the earth but light waves evidently do not.

FOREIGN CURRENTS

SO much nonsense has lately been written in the newspapers about so-called "wireless" telephony that a few extracts from an authoritative article on the experiments that have been made in Germany by Herr Ernst Ruhmer will probably prove of interest. It has previously been pointed out in these notes that somewhat similar experiments to those of Herr Ruhmer were carried out years ago in this country, and that such work, however beautiful it may be from a scientific point of view, is not really wireless telephony at all. From the very nature of the method employed it is impossible to give the transmission any but a very limited range, and there is no resemblance whatever in these experiments to the recent sensational developments in wireless telegraphy, nor is there any probability of so-called wireless telephony approaching the performance of wireless telegraphy. The London *Electrical Review* in its article on Herr Ruhmer's work uses the heading "Recent Experiments on Optical Telephones." "Optical telephones" sounds very much less alluring and sensational than "wireless telephony," but it exactly hits the nail on the head.

* * *

The *Review* says that it is only about four years since the first experiments were made on the speaking arc lamp (probably alluding to the American experiments referred to above) and that to those to whom these experiments were first shown it seemed that what they then saw demonstrated was only of the nature of an interesting scientific toy. The development that has lately taken place, thinks the *Review*, promises to make the matter of some practical importance in the solution of the problem of wireless telephony. By the means Herr Huhmer has adopted he has been able to telephone with good effect for a distance of 7 kilometers (4.34 miles), by day as well as by night, the only precaution necessary in daylight being that the receiver must be protected from the direct action of the sun's rays by means of a shade or umbrella. For military or naval purposes this distance is sufficient to be of considerable service, one great advantage over other systems of signalling, including wireless telegraphy, being that the signals cannot be read or intercepted by the enemy.

* * *

The principles underlying optical telephony are fairly well known. If the variations of current produced by a telephone transmitter be suitably superimposed on the direct current through an arc, the words spoken into the transmitter are heard again proceeding from the arc. This is caused by the changes in volume of the arc following the changes in temperature of the same caused by the varying current density. The changing temperature of the arc is also the cause of a corresponding varying emission of light, and it is the latter which is used to transmit the wireless telephonic message. The fluctuations in the light emission are so quick that they cannot be seen by the eye; a receiver, however, has been found which is able to follow and respond to them. In order to direct the rays in the required direction Herr Ruhmer employs a parabolic reflector about 14 inches in diameter. A hand-fed arc lamp has been used, supplied with current from a battery, the current strength required varying with the distance to which it was desired to transmit signals. For distances of 3 to 4½ miles a current strength of 12 to 16 amperes was required.

* * *

The receiver consisted of a similar parabolic mirror, in the optical axis of which a cylindrically formed selenium cell was placed, in series with two telephones and a battery. Selenium has the property of changing its resistance with the amount of illumination falling upon it. The varying light beam from the transmitting station is concentrated by the receiver mirror on the selenium cell, the resistance of which varies with the microphonic currents in the transmitter. The current through the receiver telephone varies likewise, with the result that the word-sounds spoken into the microphone are repeated therein. This appears at first sight to be very simple, but there has been great difficulty in obtaining a suitable selenium cell. The ordinary selenium sells are scarcely affected by short light waves, which are those used in optical telephony, but Ruhmer has now constructed cells which are specially sensitive to these. It was also necessary that the cell should change its resistance quickly, so as to be affected by the quick variations of telephone currents. There are two modifications of selenium obtained by the trans-

formation of the amorphous into the crystalline variety, the "hard" and the "soft" modification. The former is better for use in the day time and the latter at night. All the various good qualities necessary are contained in Ruhmer's cells, which he encloses in a thin glass tube from which the air is exhausted. The experiments were carried out on the Wannsee and the Haver, near Berlin, where 7 kilometers was the longest distance available. Further experiments are now in hand at another place where it is hoped to obtain a transmission over 15 kilometres (9.3 miles). The result of these tests will be looked for with much interest.

* * *

These are the experiments that were recently on several occasions reported by cable to the daily papers as being a successful solution of the problem of wireless telephony. It will be seen from the above description that Herr Ruhmer's apparatus is complicated and expensive, as each transmitter must have its arc lamp and generating plant, and each receiver its delicate selenium cell and large parabolic reflector. Moreover, since the receiver must necessarily receive the direct rays of the transmitting arc lamp, the possible range of transmission is obviously extremely limited. For special purposes, such as military signalling on land or at sea, the optical telephone may very likely have valuable practical application, but as a commercial system of wireless telephony it is certainly not to be considered seriously.

* * *

Telephone methods have come to the aid of the telegraph in a curious way in London. London has some five hundred local telegraph offices and there is a large traffic between those offices, averaging about 20,000 messages a day, and on certain days often going very considerably over that figure. Almost all of this traffic has to be re-transmitted at the Central Telegraph Office, as practically no two of the branch offices have sufficient traffic to exchange to support a direct wire between them. This re-transmission of local London messages at the central office gives rise to a vast amount of complicated work, and of course to a certain amount of delay. The problem of doing away with the intermediate transmission and of giving the branch offices direct communication with each other has long occupied the attention of the Post Office officials. Probably their recent experience in telephone work has led them to adopt the method that is now about to be installed, although it is said that something of the same sort is at work in Belgium. Briefly put, the new system is practically an application of the central energy switchboard to telegraph work, each branch telegraph office becoming the equivalent of a subscriber's station on a telephone system.

* * *

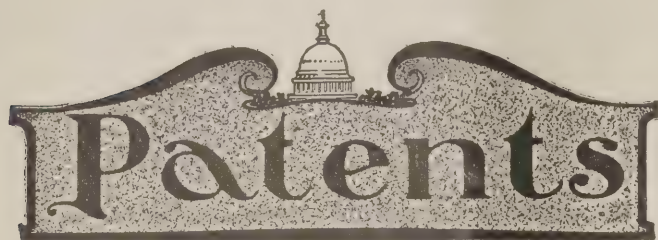
The method of working is described as follows: Each telegraph office in the metropolitan area will have a number. If an office, say, at Islington, has a message for Clapham, the operator at Islington will depress a special signalling key. This act lights a lamp signal under Islington's number at the Central Telegraph Office and at the same time causes a visual signal at Islington to be displayed. The central operator plugs into the Islington line, exactly as in answering a telephone call, and so re-sets the visual signal, indicating to the Islington operator that his call is answered. The Islington operator then telegraphs the number of the Clapham office and the Central operator connects the Islington and Clapham lines together, in the ordinary telephone manner. Islington then sends his message direct to Clapham, and when the transmission and acknowledgment of the message have been completed, both stations depress their signalings and so light a clearing-out lamp at the Central office, on which signal the Central operator disconnects. The system is of course worked by central energy. At first only 138 offices, or about one-fourth of the total number in the metropolitan area, will be connected on the new system, but it is intended ultimately to equip all the five hundred odd.

* * *

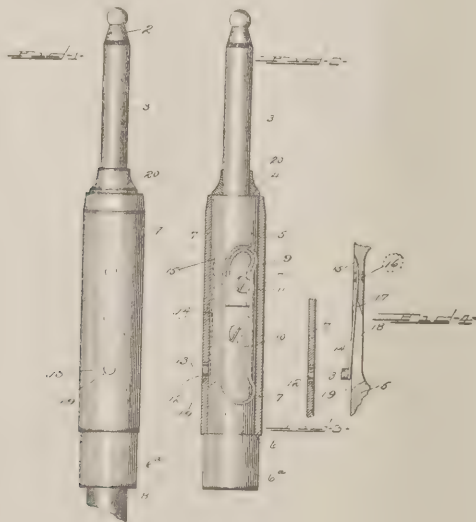
This is a highly interesting example of the telephone coming to the aid of its elder sister the telegraph. It will probably not be very long before the British Post Office officials go the one step further that obviously suggests itself and turn the telegraph offices into telephone stations pure and simple. The prejudice that still exists in many minds against the telephone for the transmis-

sion of written messages is a very foolish one. "No record by which to trace errors," say those who condemn the telephone for this purpose. And yet a vast amount of telegraphic business is received every day by sounder pure and simple, and there is no record by which to trace errors, nor is any wanted. The point is not that there should be a record by which to trace errors, but that there should be no errors. What the public wants is accuracy in their messages. If an error is made it in no way interests the victim, who was responsible for it. With proper system the transmission of written messages by telephone may be done just as accurately as by any system of telegraphy, and very much more quickly and cheaply. The telephone will probably never wholly supplant the telegraph, but it has already largely encroached on its field, which is but natural, as the telephone is simply a more direct, more rapid and more economical form of telegraph than that which requires a trained operator at each end of the line. In this work of dealing with the local telegraph traffic of a large city the telephone is certain sooner or later to supplant other appliances.

The Arrester.



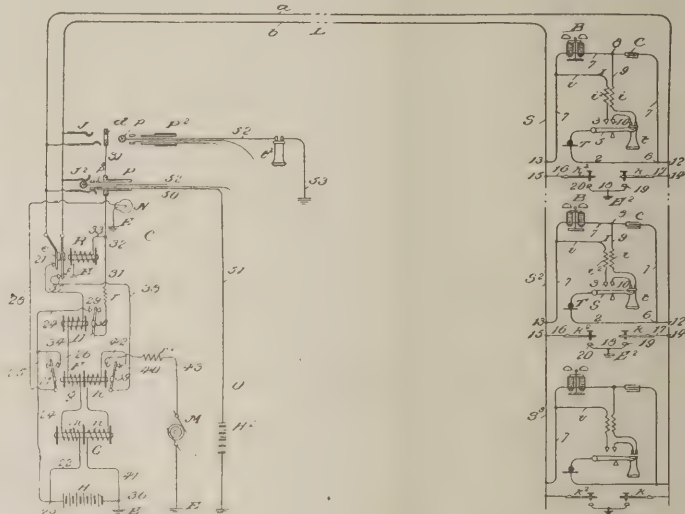
Henry P. Clausen, of Chicago, Ill., patents (711,556, October 21, 1902), and assigns to the American Electric Telephone Company, a telephone switchboard plug. This invention consists of a device for fastening the insulating handle to the plug proper. In place of the screw ordinarily used, a spring to which is attached a button, or stud, is fastened to the inner metal part,



and the button is so arranged as to fit into a hole in the outer shell, when the shell is in the proper position, thus holding it firmly in place. Referring to the drawing, 12 represents the hole, 13 the button, and 14 the spring. To remove the shell it is only necessary to depress the button, allowing the shell to be easily slipped off. An insulating ferrule 20, is added, which serves to insulate the plug proper from the test ring of the jack.

David S. Hulfish, of Chicago, Ill., patents (711,973, October 28, 1902), and assigns to the American Bell Telephone Company, a signalling and switchboard apparatus for telephone exchange circuits. This invention pertains particularly to central-battery systems, in which there are party lines operated. In the ordinary central-battery party line, it is necessary to call central, in order to have a second subscriber on the same line notified, but the apparatus here described allows each station in the party line to call the other stations by ringing the proper signal in the

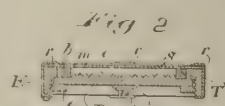
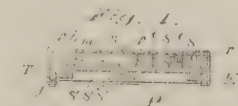
bells at the several stations. Each telephone instrument is supplied with two buttons, or keys, one being used to call central when a connection is desired with another line, and the other being used when a signal is to be sent out in the same line. At the central station, three relays are used for each line, one for the line cut-out, another for causing the line to test "busy" when two stations are talking on the same line, and the third for signalling on the party line from a station on the line, and also for operating the lamp signal to attract the operator's attention. Referring to the drawing; k represents the key used for calling a station on the same party line, forming an earth connection at E^2 , with the line a , relay D, (operating the busy test) coil g of the relay F, (closing the circuit of the lamp signal N, and also of the ringing generator M) and the battery H, which is earthed. Thus each time the key is depressed the lamp at central flashes, and a ringing current is sent out over the line b , which rings all the bells on that party line through the same earth at E^2 . By the flashes, central is aware that a party line call is being made and does not answer and as soon as the desired subscriber removes his receiver in response to the call, current from the battery H passes through both coils of the relay F making it inoperative, and at the same time current is



furnished to the transmitter, etc., at the two stations which are conversing. Before making the call, the receiver should be removed momentarily to see if the line is busy and then replaced until after the call is made. To call central the receiver is removed, but is not replaced until the conversation is finished. K^2 is depressed for this purpose, which earths the line a , through the talking circuit as previously described, but at the same time the line b is earthed thus preventing the ringing of the bells, as the ringing current passes directly to earth at E^2 . When the plug is inserted, the line cut-out relay operates in the usual manner, and the busy test connection is made through the jack in the ordinary way.

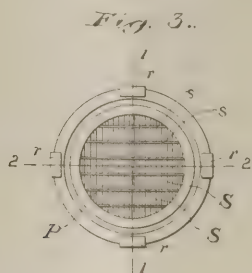
David S. Hulfish, of Chicago, Ill., patents (712,455, October 26, 1902), and assigns to the American Bell Telephone Company, a busy test system. This invention pertains to the apparatus previously described under Letters Patent 711,973 and relates to the method of forming a busy test by the removal of a receiver at a party line station or by the use of the key at K and by the operation of the relay D. The object is to protect two stations on the same party line who are conversing, from being interrupted, there being no plug connection made at central, although means are provided for the same protection in case plug connection at central is found necessary. The same drawing applies to both specifications, and the operation of the busy test is shown in the previous description.

Raoul Gaillard and Eugene Ducretet, of Paris, France, patent (712,059, October 28, 1902), a microphone for high-tension cur-



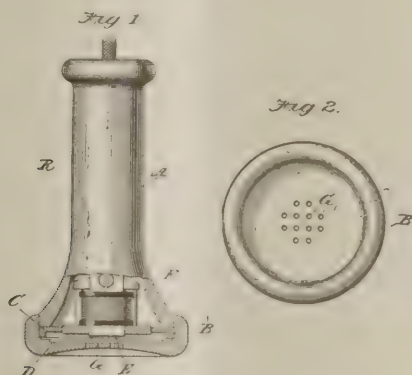
rents. This invention relates to microphones used on high-tension currents and consists of an improved arrangement of the

interior parts and construction. The interior of the microphone is divided into a number of lateral sections or compartments, *S S* containing the granules of carbon or similar material *c*. The solid electrode *P*, consists of a ridged or corrugated conductor, preferably of metal faced with an unoxidizable surface. The



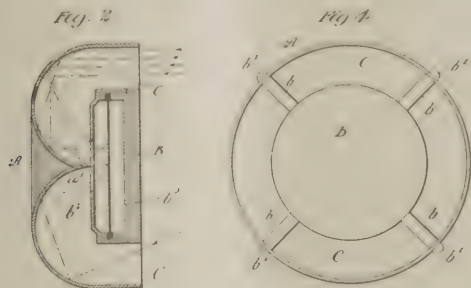
vibrating electrode or diaphragm is preferably of carbon and is held in place by a ring *b* and several clips *r r*, etc. The several sections are separated by strips of fabrics *s s*, etc., resting in the grooves *s' s'*, etc. The entire interior is surrounded by a soft felt ring *T*, firmly fastened to the electrode *P*.

Willard M. Miner, of Plainfield, N. J., patents (No. 711,640, October 21, 1902) and assigns to the Sun Electric Manufacturing Company a telephone receiver. This invention pertains especially to the cap of a telephone receiver, and replaces the customary large hole by a number of small holes. The object of this is to prevent the insertion of any article, such as a knife or



screwdriver, through the hole in the cap and thus injure the diaphragm and decrease the efficiency of the receiver. The same idea has already been applied to telephone transmitters to prevent the tapping of the diaphragm with a lead pencil while waiting for connections, and should be equally effective in preventing damage to the delicately adjusted receiver diaphragm.

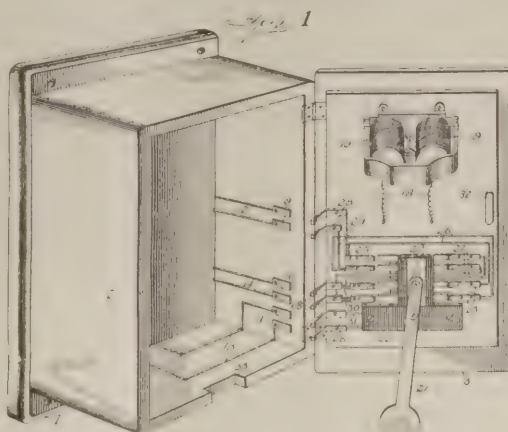
Charles L. Hyde, of Tuxedo Park, N. Y., patents (711,974, October 28, 1902), assigns by mesne assignments to Hutchinson Acoustic Company, a sound concentrator. This invention pertains to a device for concentrating and focussing sound waves to the sensitive portion of a diaphragm. It consists of a cup-shaped



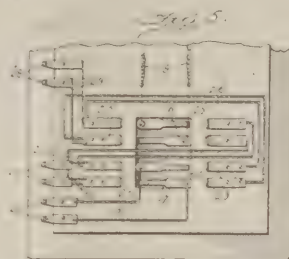
body so arranged as to receive the waves through the open end and reflect them all to the centre of a diaphragm of a telephone transmitter or similar piece of apparatus. In the drawing the sound waves are shown passing through the openings at *c c* and reflecting from the sides to the centre of the diaphragm *b* through the opening at *b*.

George T. Newman, of Bonaparte, Ia., patents (712,402, October 28, 1902), a telephone attachment. This invention relates

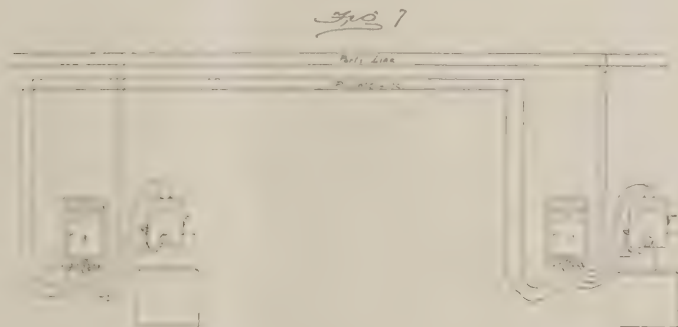
to a device for switching a telephone in or out of a circuit with either a private or party line. It is provided with a signal bell which acts in conjunction with the bell on the telephone, one or



the other, being always connected to the private or party line, respectively. As shown in the drawing, three circuits enter the box, the private line, party line, and local telephone. When



the switch lever is thrown to one side, connection is made between the party line and telephone, and at the same time the bells on the device is connected to the private line. When the



switch is thrown to the other side, the operation is reversed. In either case both lines terminate with bell coils allowing signals to be received from either line at any time.

A NEW SPECIES OF TELEPHONE POLE

"MR. SHAW, the telephone company is going to place a pole in front of my residence. I won't have it. What shall I do?" These outbursts greeted the present secretary of the treasury one day some years ago, as he was seated in his office, says the *New Orleans Item*.

"Unless you can occupy the ground in front of your residence until the company leaves, I see no redress," remarked Mr. Shaw. "Have you any men in your employ?"

"Yes, two Polish gardeners," answered the irate property owner.

"Then place into the hole a Pole of your own," suggested the secretary.

When questioned about the story the citizen explained that he got his Pole there first and the company moved on.



New Companies

BUCKINGHAM, ONT.—A new telephone company has been started in Buckingham to connect that place with l'Original rapids, passing through Notre Dame de la Salette and intermediate places covering a distance of about one hundred miles. Power will be taken from the le bassin du Lievre and l'Original rapids, and the new company which is chartered has a capital of \$10,000, of which one-half is already subscribed. Those interested are: Rev. F. X. Lortie, of Notre Dame de la Salette; Messrs. Henri Lortie and Camille Lapointe, of the same place; Joseph Tom Kiswicz, M. Poltimore and Uric Rouville, of Paris, France. The new line has been already surveyed and the right of way obtained.

OCEANSIDE, CAL.—A stock company is being formed by residents of Oceanside for the building of a local telephone system. The plan is to construct lines that will reach as far as Julian, connect Palomar with Oceanside and give the telephone service to all the small communities on the line projected.

BYRON, ILL.—The Byron Telephone Company has been incorporated with a capital stock of \$5,000. Incorporators: George F. Bunn, Fred A. Nott and C. E. Soule.

CARTHAGE, ILL.—The farmers' telephone companies in Hancock County have organized and elected Walter Van Zilo president and Ed. Summerlands, of Burnside, secretary.

CHICAGO, ILL.—The Western Telephone Construction Company has been incorporated, with a capital stock of \$2,500. Incorporators: A. E. Ziehme, G. Hallett Johnson and John E. Kavanaugh. This company is the successor to the old Western Telephone Construction Company.

IPAVA, ILL.—A company has been organized by local capitalists for the building of a telephone line which will run from here to New Howard.

PLAINVILLE, ILL.—The Adams-Pike Counties and Hannibal Telephone Company, of Plainville, has been incorporated, with a capital stock of \$7,000. Incorporators: William H. Breckenridge, John W. Butts and Charles H. Rankin.

FAIRMOUNT, IND.—The Citizens' Telephone Company has been incorporated, with \$10,000 capital stock. The company will operate telephone lines in Grant, Wabash, Madison, Howard, Blackford and Delaware counties.

TOCSIN, IND.—A number of citizens have organized a local telephone company, and are drawing up articles of incorporation. The plan proposed and which is fully covered in the articles being drawn up is to fully cover Tocsin and extend the line to supply all the farmers northeast of Jefferson. At places they would also extend to Allen and Adams counties. At present there is such a plant in successful operation. It is the Tri-Union Telephone Company, with headquarters at Uniondale. Its lines reach Markley, Zanesville and Sheldon, and the patrons are universally pleased with the services rendered.

ELDRIDGE, IA.—M. Gertz, of this place, will build a farmers' telephone line in this vicinity to furnish service to all the neighboring farms.

KLEMMIE, IA.—A new telephone company will, in all probability, be organized here.

SHELBURN, IA.—A local telephone company is being organized here. It is proposed to run a line westward and connect with the Fairbanks and Farmersburg local lines. Provision will be made for connection with the Sullivan and Hymera lines also. The company will be organized on the co-operative plan by the business men and farmers of this place and vicinity, and when completed will embrace nearly 500 miles of lines.

AUGUSTA, ME.—The Crosley Telephone Company, of Augusta, has been incorporated, with a capital stock of \$10,000, for the purpose of constructing and operating telephone and telegraph lines. Byron Boyd, Augusta, is president, and M. W. Crosley, of Readfield, Mass., treasurer.

PORTLAND, ME.—The Automatic Receiver Holder Company has been organized for the purpose of making an automatic telephone receiver holder. The capital stock is \$10,000, of which nothing is paid in. The officers are: Miley Foster, president; Horace W. Soule, treasurer; J. H. Hammond, Jr., clerk; Miley Foster, Horace W. Soule and Ralph W. Foster are directors.

CUMBERLAND, MD.—Application has been made to the Governor of Pennsylvania by B. F. Madore, of Bedford, Pa., and George W. Randall and Urner G. Carl, of Cumberland, for a certificate incorporating the Western Maryland and Hyndman Telephone Company. The company will maintain a telephone system in Bedford County, to connect with Cumberland, and will have long-distance connections. Bedford, Somerset and Johnstown will also be connected.

MAPIMI, MEX.—Ascencion Galvan has forwarded a petition to the State Legislature asking for an exemption from taxation on the sum of \$50,000, which is proposed to be invested in a telephone system in this city.

AUSTIN, MINN.—The Austin business men are seriously considering the proposition of organizing a stock company, with a capital of \$50,000, for the purpose of erecting and maintaining a local telephone exchange, which will furnish good service at a considerably less rate than the inferior service now furnished by the Bell Company costs.

JASPER, MINN.—A telephone system has been organized in Jasper upon the co-operative plan and the work of building an exchange will commence soon. The president of the Western Electric Telephone Company has made arrangements to have the local company handle his business for this place.

FREWSBURG, N. Y.—The Home Telephone Company has been incorporated. The service will also extend to several nearby towns.

ISCHUA, N. Y.—A stock company has been organized here, known as the Ischua Electric Light and Telephone Company. It will furnish electric current for lighting and power and also operate a telephone system. The officers are: Wales Chamberlain, president; J. H. Wagner, vice-president; Warren F. Moulton, secretary, and E. T. Seward, treasurer.

OTISVILLE, N. Y.—Steps are being taken here to organize a local telephone company, which will connect with Port Jervis, Howells and Middletown on local lines.

CLARINGTON, O.—A move is on foot to organize a new telephone company to connect with Moundsville, W. Va., and put an exchange here.

PARKMAN, O.—The Parkman Telephone Company has been incorporated, with a capital stock of \$9,960, by H. H. Jones, W. C. Pay, A. C. Wygant, C. M. Bundy and Frank Owen.

NEW HOLLAND, PA.—Several meetings have been held recently by citizens of this borough and surrounding neighborhood with the view of organizing a local telephone company for the purpose of bringing the telephone into more general use in people's homes and small places of business. There is a similar local company in working order at Morgantown, and the low rates at which telephones are given to subscribers enables more persons to have telephones than are now in use. A partial organization has been effected by the election of Wm. M. Stauffer president and E. H. Burkholder as treasurer. Application will be made for a charter in the near future.

WEST ALEXANDER, PA.—There is a movement on foot here to organize a local telephone company, to be known as the Farmers' and Merchants' Telephone Company. Frank Hall, of Wheeling; Mr. Buchana, of Dallas; John Jacobs, of West Liberty, and Dr. J. M. Timmons, of West Alexander, have been appointed a committee to draw up the articles of association.

CENTERVILLE, S. D.—The Rural Telephone Company, with headquarters here, has been incorporated, with a capital stock of \$5,000. Incorporators: John M. Noble, George W. Dann and J. H. Martin.

YANKTON, S. D.—A second telephone line is being run north and west of Gayville. There are nineteen subscribers and about eight miles of line. It will be connected with one running south of town. The officers of the company are: Peter Conkling, president; E. V. Cowman, secretary, and Ed. Peterson, treasurer.

WINCHESTER, VA.—Six well-known local capitalists have organized an Independent telephone company to operate a competitive service here. A charter cannot be obtained, however, until after the legislature passes the general charter law this winter.

THE WEEK'S MESSAGES *Continued*

Rates

URBANA, OHIO.—The Urbana Telephone Company has decided to increase the rate for country telephone service from \$12 to \$15 per year, to take effect January 1, 1903.

Legal

ATLANTA, GA.—J. A. Earl has been awarded a verdict of \$1,000 in damages against the Southern Bell Telephone Company. The case has been pending some time, and the decision will be read with much interest. Earl rented a store, in which there was a telephone used by a previous tenant. This tenant, it seems, failed to pay the telephone company, and when Earl rented the place it tried to make him pay the arrears due from the previous occupant. This Earl refused to do, and the telephone was forthwith taken out. For this Earl filed suit against the company. The judge decided that a subsequent tenant was not liable for the debts of a former one, owed for the rent of a telephone.

DETROIT, MICH.—The local law firm of which ex-Postmaster-General Don M. Dickinson is the head, representing the Old Colony Trust Company, of Boston, has filed a bill in the United States Circuit Court to foreclose mortgages of the Michigan Telephone Company. The suit is brought in default of the last semi-annual interest. The aggregate of the mortgages is \$5,000,000. The law firm has not filed a bill for the foreclosure and sale of all the properties of the telephone companies for the whole debt, but only for the defaulted interest. The mortgages are for 5 per cent.

PLAINFIELD, N. J.—Settlement in the suit brought by Willard M. Miner, of LaGrande avenue, against the Telephone and Cable Company of America has been made, just previous to the case being called for trial in the First District Court before Judge Crouse, at Jersey City. Francis J. Blatz, of this city, represented the plaintiff in the matter, and Condit, Black & Drayton, of Jersey City, appeared for the defendants. Miner sued to recover \$150 for expert services furnished the company in the past three years. He was an examiner of instruments purchased by the concern, but it differed over the price to be paid. Every preparation was made to fight the case, but at the last moment the defendants' counsel realized it was best to settle.

Financial

CHILLICOTHE, ILL.—A stockholders' meeting of the Chillicothe Telephone Company has been called for the purpose of increasing the capital stock and transacting other business.

BOSTON, MASS.—The statement of the operations of the Mexican Telephone Company for the month of August, and for the six months of the company's fiscal year to August 31, shows comparatively as below:

	1902.	1901.	Inc.
Gross.....	\$20,362	\$17,488	\$2,874
Expenses.....	12,696	11,041	1,656
Net.....	\$7,666	\$6,447	\$218
Since March 1:			
Gross.....	119,030	104,541	14,489
Expenses.....	65,446	58,584	6,863
Net.....	\$53,584	\$45,957	\$7,626
Total subscribers.....	4,249	3,703	546
Gain since March 1, 318.			

AKRON, OHIO.—The Akron People's Telephone Company has declared a quarterly dividend of 1 per cent.

WASHINGTON, PA.—A meeting of the stockholders of the West Penn Telephone Company was held here recently, and it was decided to increase the bonded indebtedness of the company \$25,000. It was decided also to purchase the franchises of the Chartiers Telephone Company. The West Penn Company has made an arrangement whereby connection is made with the lines of the Pittsburgh & Allegheny Company, of Pittsburgh, insuring long-distance service.

Elections

GREENSBURG, IND.—The following directors have been elected for the Decatur County Independent Telephone Company: M. E. Newhouse, M. L. Miers, C. P. Miller, J. H. Christian, O. G. Miller, T. E. Davidson, Charles Zoller, Jr., Walter B. Pleak, James B. Lathrop. The report of the secretary showed that the total receipts of the company for the year ending October 6 were \$52,426.39. There was a balance on hand a year ago of \$1,323.66. The expenses for the year were \$53,092.86, leaving a balance of \$657.59. At the beginning of last year there were 493 telephones in use; at the beginning of the present year there were 922, a gain of 429 for the year. The total rental last year was \$3,969, while this year it reached \$9,321.05. The probable revenue for next year will be about \$13,000, with an estimated expense of \$5,500. At the present time the plant is paying 20 per cent. on

cost of construction, which has been \$61,441.82. The toll increased from \$88.85 last year to \$803.23 this year. At the present ratio the company will be able to pay all expenses, interests on bonds and reduce their bonded indebtedness \$2,400 each year. During the year three exchanges were put in, as follows: Seventy-two telephones at Clarksburg, 33 at Burney and 86 at Letts.

CARLETON, MICH.—The annual meeting of the People's Telephone Company of Monroe and Wayne Counties was held here recently. Joseph Waltz was elected president; F. L. Edwards, secretary and treasurer; Joseph Waltz, Earl Gildsmith, Wayne; Jesse Butler, Willow; T. J. A. Milliken, New Boston, and F. L. Edwards, Carleton, directors. The company is in a good financial condition and some needful improvements will be made on the lines.

APPLETON CITY, MO.—A permanent organization of the Farmers' Mutual Telephone Association has been effected by the election of J. M. Hyde president; C. F. Chapin, secretary, and Mrs. Etta Gladden, treasurer. A proposition to establish a free exchange service at Rockville was accepted. It was also decided to charge a fee of 10 cents for transient messages between Appleton City and Rockville. Those having telephones along the line will have free service to the exchange in Appleton City.

PERTH AMBOY, N. J.—At the annual meeting of the Hudson and Middlesex Telephone Company S. R. Farrington, Albert Bollschweiler and Ira J. Mandeville, of this city, and William J. Lansley and Thomas F. Dunigan, of Woodbridge, were elected directors. Efforts are being made to secure a franchise in Perth Amboy. The company expects to begin installing its system as soon as the franchise is granted. House telephones will cost \$2 per month, and but \$3 per month will be charged for other service.

BUFFALO, N. Y.—The following have been elected officers of the Frontier Telephone Company: President, Elgood C. Lufkin; vice-president and general manager, Wm. A. Douglas; secretary and treasurer, Charles B. Hill.

DUNKIRK, N. Y.—Stockholders of the Dunkirk Home Telephone Company have elected the following officers: President, Robert McKay; vice-president, Daniel Scannell; secretary, James M. Madigan; treasurer, H. H. Droege; directors, Robert McKay, Daniel Scannell, H. H. Droege, Newell F. Gould, Samuel B. Rawson, T. M. Brush, I. H. Griswold and F. H. Sudro. Since its establishment in Dunkirk a year ago this company has run the list of its subscribers up to 300. Every telephone is on an individual line with a complete metallic circuit. Its officers are prominent business men, who are deeply interested in the development of the city.

Franchises

COVINA, CAL.—The Home Telephone Company, of Los Angeles, has petitioned the board of supervisors for a franchise here. The board ordered a franchise advertised for sale, bids to be opened November 1.

PASADENA, CAL.—If the city council fails to advertise the telephone franchise for which A. R. Metcalfe has made application, it will not be for the want of a vigorous expression of public sentiment in favor of giving the people of the city an opportunity to connect with the 10,000 subscribers which the Home Company has secured for the new Los Angeles exchange which is soon to be opened. Mr. Metcalfe has had a petition prepared for submission to the city board. It also appears that the publicity given to the reports of the whole recently has aroused the people to a sense of the city's danger of being cut off from any possibility of conversation with their friends and business connections that may be exclusive patrons of the Los Angeles opposition, and prevent those who have business in the city from exercising an option in the choice of office telephones and yet have communication with their Pasadena homes.

SANTA ANNA, CAL.—The city council has awarded the franchise for a telephone, telegraph, burglar alarm and district messenger service to C. B. Frazier, of Los Angeles, for \$300. The franchise was applied for by C. F. Guthridge, of Los Angeles, whose bid of \$150 was rejected.

SPRINGFIELD, ILL.—The Virden Electric Light Company has been given a franchise to construct, maintain and operate a telephone system along certain of the public highways of this county.

ANNANDALE, N. J.—The township Committee has granted the Farmers' and Merchants' Telephone Company the right to place its poles and wires on any or all the public highways of the township. This includes also the right in the towns of both Annandale and Lebanon.

WOODBURY, N. J.—An ordinance granting the Eastern Telephone Company permission to string wires along the county roads from Woodbury to Newfield has been passed by the board of freeholders.

DEPEW, N. Y.—The Frontier Telephone Company, of Buffalo, has an application before the board of village trustees for a franchise.

CRESTLINE, OHIO.—The Crestline Local Telephone Company has been reorganized and given a 20-year franchise. Jacob Babst, of this place, is president, and C. R. Callahan, of Bellevue, general manager.

TUNKHANNOCK, PA.—The Centremoreland Telephone Company has been granted permission to erect poles and string wires in Tunkhannock.

THE WEEK'S MESSAGES *Continued.*

Combinations

MIAMI, FLA.—For some time negotiations have been in progress between the Miami Telephone Company and the West Palm Beach Telephone Company, which have resulted in the purchase of the West Palm Beach Company by the Miami Company. President James T. Sanders and Manager John C. Grambling are now both busy arranging for the extension of both systems. Already fifty miles of wire have been purchased, and Mr. Grambling is busy on the extension north. The lines will be connected as soon as possible.

DECATUR, ILL.—Sam Gerber, Peter Gerber and S. O. Bilbrant have purchased the franchise of the Argenta Telephone Company for the sum of \$1,800. The deed has been filed for record and conveys, besides the franchise, the permission of the supervisors of several counties and the road commissioners of the same districts to plant poles and string wires. With the exception of the instruments and the switchboard, all the paraphernalia of the company is turned over to the new owners. The Macon County Telephone Company, in which the parties named are stockholders, has refitted the lines with Burke instruments, and the exchange is again open and in better condition than for some time. O. E. Duddleston was retained as manager of the office, which has now 125 subscribers.

ALGONA, IA.—The Algona Telephone exchange has been sold to parties from Germania for \$7,000.

BEDFORD, IA.—The Bedford telephone exchange, formerly known as the Conway Line, has been bought by J. C. Beauchamp and Prof. Ash, who are now in possession. An expert electrician has been employed and extensive improvements and additions are in contemplation. Negotiations are also pending looking to consolidation with the Farmers' Mutual.

GEORGETOWN, KY.—Jos. S. Lancaster, of Georgetown, and R. B. Lancaster, of Lebanon, have sold the plant of the Georgetown Telephone Company to H. F. Duncan, of Louisville; Mrs. Nannie Craig, Henry Craig, Judge George V. Payne and John R. Downing, of Georgetown. The plant will be rebuilt at once and the new company will spend \$20,000 or \$25,000 on it. They will use the central energy system. The system will be extended to every part of the county. J. S. Lancaster will continue as manager for the present.

PLATTSMOUTH, MO.—The Plattsouth Telephone Company has purchased the Elmwood exchange and will entirely remodel the plant. One hundred farmers will have exchange connection, and a new 300-drop switchboard will be installed.

SODUS, N. Y.—The Wayne County Telephone Company has made a proposition to purchase the entire systems, including rights of way, pole lines, switchboard, telephones and all rights and material belonging to the Sodus Telephone Company, with one year's subscription from each of the present subscribers to the number of twenty-four at a rate of \$12 for residences and \$15 for business places and to pay therefor \$600 in stock in the Wayne County Telephone Company on its part to promptly put the system in good working order. The Wayne County Company owns several exchanges and is trying to secure control of all private companies in the county. The Clyde, Newark, Lyons, Savannah, Spring Lake, Wolcott and other exchanges are owned by this company. If the deal goes through, the company will construct a line to Sodus Point.

SOUTH CHARLESTON, OHIO.—Messrs. D. and Oscar Bradfute have purchased the stock of the Cedarville Telephone Company, belonging to the Rankin Bros., of South Charleston. These men have since the organization of the company held the controlling stock, and from now on the company will be entirely in the hands of Cedarville capitalists. The capital stock of the company is \$15,000, of which the Bradfutes own all but \$900. The capital stock will be increased, as they expect to build more lines and make some needed improvements.

Underground

DANVILLE, ILL.—The Vermillion County Telephone Company has submitted a proposition agreeing to put its wire underground and give several other concessions to the city if the latter will take off the proviso for paying the city 5 per cent. of its gross receipts above \$10,000.

CLEVELAND, OHIO.—The county commissioners have granted the Cleveland Telephone Company permission to lay conduits on several streets here before they are paved.

Construction.

ARCADIA, FLA.—The Arcadia Electric Light, Ice and Telephone Company has the telephone line completed to Gardner. Poles are up as far as Zolfa, but the wires have not been strung. Connections will be made at Bartow with the line to Tampa.

CUMMING, GA.—A contract has been let to Charlie Otwell, of Roswell, for a telephone line from here to Buford, and the poles for the wires are now being put along the route.

GAINESVILLE, GA.—Col. H. P. Farrow, postmaster at Gainesville, will build a line of telephone from Porter Springs to Cleveland to connect with a line almost completed between Cleveland and Blairsville.

BLOOMINGTON, ILL.—The Home Telephone Company is carrying on the work of rebuilding its line in Normal. Numerous wires have been taken down and the large cables which were recently stretched substituted.

CANTON, ILL.—The Canton Home Telephone Company expect to commence the work of construction soon. Several carloads of poles and a carload of cement have arrived. It is expected that the underground work can be completed in three weeks.

ROCK ISLAND, ILL.—Manager Fitzgerald, of the Union Electric, Telephone and Telegraph Company, stated that work on the system now being installed here is progressing nicely, and connection will shortly be made with the new switchboard. The work of drawing the cables in the underground conduits is nearly completed.

BATESVILLE, IND.—The Batesville Telephone Company is having new poles erected, and will make all its line full metallic.

GOSHEN, IND.—The Home Telephone Company has decided to install an exchange at Elkhart during the winter, at a cost of \$24,000.

LAFAYETTE, IND.—The work of connecting with the lines of the Stockwell Co-Operative Telephone Company is well advanced, but has not been completed. It is expected to have the connection made soon. The Lafayette Telephone Company is bringing several new lines into the city. The line from Lafayette to Frankfort, direct through Mulberry and Dayton, will be brought in at the same time the Stockwell line is finished. The company has received copper wire for a new circuit to Indianapolis. When this line is completed there will be two direct lines to the capital city and a third via Frankfort. The very best material is being used in the construction of these lines, and they will be the best that can be built.

MARION, IND.—The United Telephone Company is spending a large sum of money in perfecting its system here. Its switchboard now has an equipment of 1,450 lines, with 50 more to be connected, and an ultimate capacity of 3,500 lines.

SHOALS, IND.—The directors of the Shoals, Indian Springs and Bedford Telephone Company met here recently and made an assessment of \$3 per share for the improvement of the line.

TERRE HAUTE, IND.—The Citizens' Telephone Company will commence work soon on three branch lines, to Fontanet, Coal Bluff and St. Mary's. The poles are already on the ground, and as soon as the other supplies arrive work will be pushed with all possible speed. The same company is now building a private line from Coal Mont to the Lattas Creek Coal Company's office.

CARLISLE, KY.—The Carlisle Telephone Company is setting poles for a line to Headquarters and to Hinkson Creek to connect with Flat Rock.

HUME, MO.—M. L. Beadles, manager of the local telephone company, has arranged to unite the telephone systems in this town and in Rich Hill and Butler under one management. He will construct lines to these towns, and also several additional country lines.

ST. LOUIS, MO.—The Kinloch long-distance telephone line from St. Louis has been built to Marshall, Ill., and will soon reach Terre Haute, Ind. Here it will connect with the Citizens' Company, the home Independent company, which has practically monopolized the local telephone business.

GREAT FALLS, MONT.—Rev. H. E. Robbins, of Fort Benton, was in the city recently and took steps toward getting material for the new telephone line which he intends building between that town and the Highwood country, east of Great Falls. The new line will be called the Highwood-Shonkin line, and will run south from Benton up the Shonkin and Big Sag to the source of the Highwood Creek and down that as far as Baker's Ranch.

FREMONT, NEB.—The Fremont Telephone Company is pushing the construction work of its exchange. The directors recently decided to connect farmers' telephone companies on equitable terms.

CLINTON, N. J.—The towns of Clinton, Annandale, High Bridge, Lebanon, Whitehouse Junction and Pittstown are being connected by telephone.

BUFFALO, N. Y.—The first thirteen sections of the Frontier Telephone Company's switchboard have been received. This portion of the immense board the company will install at once. Nine other sections are now on the way, and as these will be installed immediately, the company will be in a position to handle 8,000 subscribers. Other sections will follow as fast as the working force can install these and make ready for them. The board comprises in all fifty-seven sections, with a capacity of 18,000 subscribers.

GRANT, N. Y.—A public telephone line is being built between Grant and Cold Brook by residents along the line.

JEFFERSON, N. Y.—The Jefferson-Summit telephone line, owned by C. B. Hubbell, Dr. R. Hubbell and Charles E. Nichols, is improving its system. The Jefferson-South Jefferson telephone line, owned by C. B. Hubbell

THE WEEK'S MESSAGES *Continued*

and Doctors Hubbell and Landon, of Stamford, is also making improvements.

KENT, N. Y.—The Rural Telephone Company is constructing a system in this vicinity.

LOCKPORT, N. Y.—The Home Telephone Company is soon to install new telephones throughout the city, of the same pattern the Frontier people are now placing in Buffalo. It is also said that negotiations have been in progress for some time for property on which to erect a modern telephone plant and store house.

OLEAN, N. Y.—The Inter-Ocean Telephone Company is constructing a line from Portville to Olean, which is the missing link between the western and eastern system of Independent telephone exchanges.

OSWEGO, N. Y.—The Empire State Telephone Company is building a new line from Auburn to this city by way of Weedsport, Port Byron, Cato, Ira, Martville, etc. Manager Joyce will construct the line from this city to Hannibal, where connections will be made with the men building the line from Auburn this way. With the completion of the above line, there will be running from the Oswego office new copper wires connecting direct with Syracuse, Auburn, Rochester, Watertown and Utica.

SHERIDAN, N. Y.—Work has finally been resumed on the local telephone line which was blocked when it first began to be put through, nearly two years ago. A better and cheaper service to neighboring towns will be the result of the line's completion.

UNADILLA, N. Y.—A new long-distance telephone is soon to be built through Unadilla. The advance men of the new company have been in town securing the permission of property owners to set poles on their lands, paying them \$1 for each hole dug.

PATASKALA, OHIO.—Material has been ordered for Pataskala's new telephone exchange, and work on the plant will be commenced as soon as the Utica exchange is fully equipped. The Utica exchange is in operation now. Like Johnstown and Croton exchanges, the Utica and Pataskala systems will have connection with the Independent exchange of Newark. The Newark company is now spending \$50,000 in rebuilding its exchange, everything, including poles, cables, wires, switchboard and telephones, being renewed. The old apparatus will be discarded about December 1.

BRINKHILL, PA.—The Bradford County Telephone Company will soon have a line through this place to Athens.

CONESTOGA, PA.—The Conestoga Telephone Company has agreed to extend the line through Geigertown and vicinity to Birdsboro, thus reaching Reading by a direct line.

ERIE, PA.—The Mutual Telephone Company, of Erie, is extending a telephone line from Waterford to Weeks' Corners via West Greene. The telephone company is largely patronized by the farmers. In a short time it is expected that a line will be put in operation to Boscobel and Phillipsville.

WASHINGTON, PA.—The Federal Telephone Company has a force of men at work erecting poles between Washington and Lone Pine. This line when completed gives Washington direct communication with Waynesburg.

WAYNESBURG, PA.—An effort is being made by the Standard Telephone Company, of this place, it is said, to work over the lines of the Federal Telephone Company, and thence to the lines of the Pittsburg and Allegheny Company.

CHERAW, S. C.—The Chesterfield Telephone Company, of Chesterfield, is making arrangements to install a local telephone system here.

JELLICO, TENN.—The East Tennessee Telephone Company will commence work in about a week on the construction of a new direct line from here to Knoxville. The line will be constructed in the best possible manner, using good, substantial poles and all full metallic copper circuits.

RANDOLPH, VT.—The People's Telephone line, which is now nearly completed between this village and the Center, is owned by Drs. Scott, Bailey, Gifford, Russlow and Angell, G. H. Slack and H. C. Allen. There is talk of extending it to Snowsville this fall, with a branch line from E. N. Godfrey's to Braintree Hill, going through Perth.

EVERGREEN MILLS, VA.—The Prince William and Loudoun Counties Telephone and Telegraph Company held a meeting here recently and made arrangements to construct a line from Aldie to this place.

GLOUCESTER, VA.—At a recent meeting of the directors of the Tidewater Telephone Company held here it was decided to rebuild the line from here to Saluda, using new poles, longer cross arms and increasing the number of wires.

KILMARNOCK, VA.—It is stated that work on a branch line of the Northern Neck Telephone Company, from Kilmarnock to Weems, will soon be commenced.

LLOYDS, VA.—The Upper Rappahannock Telegraph and Telephone Company has completed its line between Blandfield, the home of its president, Robert Beverley, and Champlain and has two forces at work, one putting up the line in the direction of Tappahannock and the other working towards Fredericksburg. The company hopes to have the line completed

by the 1st of January. It will connect with the Tidewater Company at Tappahannock, by exchange.

CAMERON, W. VA.—The Citizens' Telephone Company, of this place, is constructing a line from Big Tree to Deep Valley. The line will soon be connected with Wheeling through Moundsville with the National Telephone Company.

PARKERSBURG, W. VA.—The West Virginia Western Telephone Company has signed a contract to construct a line from here to Lubeck.

ASHLAND, WIS.—C. A. Lamoreux and T. C. Jacks, of the Ashland Home Telephone Company, have returned from Mellen, where they have made arrangements to establish a toll line and connect with the Ashland line. A long-distance line is being built from Mellen to Phillips, and when the new line is built Ashland will be connected by telephone with all the towns in the southern part of the county. The new line may connect with Duluth.

EUREKA, WIS.—The Eureka Telephone Company is extending its lines from Neosho to Juneau via Hustisford, and will connect a number of farmers on the line that desire the service. This will add twenty more miles of wire to the line. The line will also connect with the Theresa Telephone Company, which is building into Rubicon from Theresa.

Miscellaneous.

WASHINGTON, GA.—The Wilkes Telephone and Electric Company has just completed a long-distance telephone line, connecting Washington with the smaller towns in this county.

BLOOMINGTON, ILL.—The Southern Union Telephone Company has completed the construction of its line in west end of Randolph County, and its system is now complete. The new district embraces the town of Venedy, Venedy Station, Lively Grove, Stone Church, Oakdale and Coulterville.

ROCKFORD, ILL.—The Home Telephone Company now has 1,000 telephones installed, and is thus up to the number required by its franchise as called for by the city ordinance before its service can be charged for. New instruments are being put in every day, and the number of subscribers will soon be much in excess of this number.

SILVERLAKE, IND.—The Automatic Telephone Company, of Silverlake, has recently placed in position over forty telephones, and as many more will be added in the near future.

SOUTH BEND, IND.—Representatives of the various Independent telephone systems in this vicinity met here recently and discussed the toll situation in Indiana and Michigan, with a view of connecting all the Independent exchanges in these States and making a material extension of the already finely equipped toll service. The plant of the South Bend Home Telephone Company, which will begin operations in a few days, was carefully inspected and pronounced one of the best in the country. Among the telephone men present were Rome Stephenson, of Rochester, Ind., president of the Indiana Independent Telephone Association; Walter J. Uhl, secretary, and George W. Seybold, treasurer of the Logansport Company; Mayor D. C. Knott, president of the Plymouth Company; George Pfister, manager of the Elkhart exchange; Miss Cover, manager of the Goshen exchange; ex-Mayor E. M. Van Dusen and C. M. Taylor, secretary and manager respectively of the Michigan City exchange; R. F. Price, secretary, and C. W. Stacy, manager of the Benton Harbor, St. Joseph and South Haven companies. In addition to these, there were present also representatives from Bremen, Nappanee, Wakarusa and other places.

BALTIMORE, MD.—The Maryland Telephone Company has formally opened its service between Baltimore and all the towns and villages, large and small, in Harford County, and there is not a mile of ground, so to speak, but is directly connected with Baltimore and its suburbs by the Maryland's service.

BOSTON, MASS.—The American Telephone and Telegraph Company reports the following statement of operations for the month ended October 20:

	1902.	1901.	Increase.
Gross output.....	92,601	95,655	*3,054
Returned	37,155	23,374	3,781
Net output.....	55,446	72,281	*6,835
From Dec. 21 to Oct. 20:			
Gross output.....	900,935	778,826	122,109
Returned	383,844	324,663	59,181
Net output.....	517,091	454,163	62,928
Outstanding Oct. 20.....	3,042,697	2,406,979	635,718

* Decrease.

OXFORD, OHIO.—The local telephone company has extended its lines to nearly all of the business houses and many of the residences in town and the surrounding country. Connections have also been made with many of the villages and surrounding towns. What is known as the "Ezra Bourne Line" has been connected, making the service complete now to Mixerville, Bath, Springfield and Brookville on the west. The local system has for some time been connected with the lines to Darrrtown, Collinsville, Seven Mile, Morning Sun, College Corner, Camden, Eaton, Liberty and

THE WEEK'S MESSAGES Concluded

Richmond, thus giving the people of Oxford the opportunity of excellent telephone service in their homes at moderate cost. An additional switchboard will be added in the near future.

BRISTOL, TENN.—The Bristol Telephone Company has connected its lines with those of the Clinchport Company at Clinchport, Va., and Bristol now has telephone connection with Big Stone Gap, sixty-six miles northwest.

CLARKSBURG, W. VA.—The directors of the Consolidated Telephone Company held a meeting here recently. It is understood that a proposition was acted on to secure the right of way over the John Beegley system, which extends through Lewis and Webster counties. Arrangements were also made for the annual meeting of the stockholders, which will be held at Grafton soon. No proposition was presented by the Bell people to purchase the Consolidated system, as had been reported previous to the meeting.

Personal

HORNELLVILLE, N. Y.—H. M. Bennett, district superintendent for the Inter-Ocean Telephone Company, has gone on a tour of inspection of the lines in his district. He has a large force of men at work between Ceres and Olean, and expects to have their line completed in thirty days.

WATERTOWN, N. Y.—A. S. Wood has resigned his position as manager of the Citizens' Telephone Company. The appointment of his successor has not been announced. Superintendent C. D. Warner is looking after the duties of manager as well as those of his own office.

CLEVELAND, OHIO.—Henry A. Everett, of the Everett-Moore Syndicate, has resigned the presidency of the Federal Telephone Company, and also of the Cuyahoga Telephone Company, of this city. He is succeeded in both companies by Frederick S. Dickson, of New Jersey, who is connected with the John A. Roebling & Sons Company.

THE CALIFORNIA FIELD

A TABLE showing the wonderful development of the telephone in the important California cities, has recently been promulgated by the American Bell Telephone Company. This table is interesting principally in that it shows the demand for telephone service on the part of the citizens on the Pacific slope. The information given out, however, does not state that the service is satisfactory. As a matter of fact, in every one of the cities given below the Bell Company maintains a service that is nearly intolerable. Its apparatus and construction are of the poorest character, and party lines abound. In many cases, it puts anywhere from 8 to 12 or more subscribers on one line, and the resulting confusion and annoyance can well be imagined.

A good illustration of the fact that California people highly value their telephone service is shown in the case of Los Angeles, where the Bell claims over 14,000 subscribers. But that they also want a good telephone service is demonstrated by the success of the new Home Telephone Company which is now constructing a splendid system in that city. The Home Company, although it has not completed its system and has not given any service yet, has already on its list, 10,000 subscribers. This one instance shows the wide possibilities for Independent development in this State. The Bell figures are reproduced below, and may help to give a further idea of the California possibilities:

Exchange.	Population.	Subscribers.	P. Ct.
San Francisco	342,782	34,305	10.01
Los Angeles	102,479	14,231	13.89
Oakland	96,638	9,967	10.31
Portland	90,426	10,299	11.39
Seattle	80,671	9,559	11.85
Tacoma	37,714	4,599	12.19
Spokane	36,848	5,463	14.83
Sacramento	29,282	2,962	10.12
San Jose	25,150	3,740	14.87
Stockton	17,506	1,954	11.16
Fresno	12,470	2,211	17.73
Walla Walla	10,049	1,020	10.15
Pasadena	9,117	987	10.83
Everett	7,838	904	11.53
Eureka	7,327	924	12.61
Whatcom	6,833	747	10.93
Bakersfield	4,836	1,140	23.57
Reno	4,500	518	11.51
Salem	4,258	661	15.52
San Rafael	3,879	429	11.06

Watsonville	3,528	361	10.23
Marysville	3,497	430	12.30
Salinas	3,304	370	12.20
Albany	3,149	326	10.35
Visalia	3,085	378	12.25
Hanford	2,929	395	13.49
Woodland	2,886	319	11.05
Chico	2,640	368	13.94
Lewiston	2,425	317	13.07
Colfax	2,121	318	14.90

TRADE NOTES

THE VOGHT-BERGER COMPANY, makers of telephones and switchboards, La Crosse, Wis., has planned, owing to the fact that it is months behind with orders, to entirely remodel its present factory. The work will be completed as soon as possible. The woodwork now being done by outside firms, will in the future be done at the factory. All the cabinet work which the company needs in connection with the manufacture of telephones and switchboards will be manufactured in its own factory, and when completed a large number of new men will be needed to handle the work. Nearly \$5,000 worth of machinery has been purchased for this department alone.

PLANTS FOR SALE

Advertisements under this head \$1.00 for 25 words or less for each insertion. Prepaid.

FOR SALE—One of best equipped telephone exchanges in Kansas; price, \$22,000; upon which amount plant now NETS 23 per cent. If you mean business, address X for particulars, care of AMERICAN TELEPHONE JOURNAL, New York.

TELEPHONE PLANT FOR SALE—160 telephones, 100 miles of toll lines; excellent opportunity for extending business; will sell for \$12,000; pays 15 per cent. net on this amount. Address TELEPHONE CO., care of AMERICAN TELEPHONE JOURNAL.

WANTED

Advertisements under this head, 25 cents for 25 words or less for each insertion. Prepaid.

MANUFACTURERS: An engineer, experienced in designing common battery apparatus, and with excellent references, desires position with a good telephone manufacturing company. Address ENGINEER, care AMERICAN TELEPHONE JOURNAL, New York.

TRANSFER BOY, age 18; nearly two years' experience, wants position in exchange of 150 to 500 subscribers Western town preferred. Address TRANSFER, care AMERICAN TELEPHONE JOURNAL, New York.

POSITION WANTED as troubleman. Fully understands line, switchboard and instrument work. Good references. Address B. L. FAYETTE, Nappanee, Indiana.

POSITION wanted as troubleman or lineman; steady work desired by young man; references given by former and present employer. Address WM. H. DIGGINS, Care Box No. 8, Woodstock, Ohio.

EXCLUSIVE handling of an account, for Chicago trade, beginning January 1st. Manufacturers Agency basis. Address SALESMAN, care AMERICAN TELEPHONE JOURNAL, Monadnock Building, Chicago.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISELL CO., Toledo, Ohio.

POSITION as wire chief in central energy exchange of from one to two thousand subscribers; 9 years' experience; best of references. A. B., care AMERICAN TELEPHONE JOURNAL, New York.

A HOME IN SOUTHERN CALIFORNIA—I desire to communicate with a man capable of taking charge of a factory for insulating rubber-covered National Code wires. This is a splendid opportunity for the right man. References given and required. No money necessary. Address P. O. BOX 1116, Los Angeles, Cal.

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COMMON BATTERY SWITCHBOARD SPECIFICATIONS*

By CHAS. L. GOODRUM

MANY Independent telephone companies have had considerable trouble in their construction, both inside and outside, owing to the fact that the work to be done was not governed by proper and standard specifications. There are a number of people in the industry who would be glad to have a model to go by, and to this end this article has been prepared.

The specifications given below were prepared by the writer as engineer for the United Telephone and Telegraph Company, of Philadelphia. They comprise the complete specifications for the switchboard and its installation in the exchange at Norristown, Pennsylvania.

SPECIFICATIONS FOR NORRISTOWN, PA., EXCHANGE.

Type—The switchboard shall be of the multiple pattern and operate on the Common Battery or Central Energy system. Accommodation need be provided for metallic lines only, but provision must be made for selective 4 party line service. Plans to be submitted showing proposed circuits, etc.

Capacity—The ultimate capacity of the switchboard shall be 1,440 automatic metallic subscribers lines, 30 trunks and 10 magneto toll trunks. The switchboard must be arranged that future additions up to the ultimate capacity may be readily made.

Equipment—The switchboard is to have a present equipment of 640 subscribers lines, 30 outgoing trunk plugs, 15 toll trunks, and at present is to consist of 12 regular multiple sections of three operators positions each. Each subscriber's operator's position shall be provided with 160 answering jacks and lamp signals, appearing in that section only, and 14 pairs of connecting cords, etc., as hereinafter provided.

Framework—The framework is to be of iron or steel securely and properly held together by rivets, screws or bolts. It shall be of such design and construction as to remain rigid under all strains to which it may be subjected, and shall line up properly when placed upon the floor. After assembling, the entire framework shall be given a coat of good metallic paint. Each section shall have 6 panels in the multiple and 6 panels in answering jacks.

Woodwork—All woodwork on the front of the switchboard shall be of mahogany, neatly and carefully joined, shall be given a dead finish, and when completed shall have the appearance of one continuous framework. A cable turning section shall be furnished on the end of the first section and an end panel shall be provided on the end of the last section. All vacant or partially filled jack panels shall be filled with ebony finished panels or strips. The woodwork on the rear of the board shall be hard wood thoroughly seasoned, and finished to conform to suit the front of the board, and removable panels shall be provided admitting of ready access within the board. A brass foot rail shall be provided with each section. The key shelves are to be hinged in three parts, one to each operator's position. The shelves shall be built up of five layers of mahogany, thoroughly glued together, the grain of the two outside and the center pieces running lengthwise and that of the two other running crosswise. The plug shelves and the upright portion of the frame between the plug shelf and the answering panel shall be covered with best belt leather $\frac{1}{8}$ -inch thick.

The bottom of the jack panel shall be occupied by the answering jacks and lamp signals mounted alternately so that an answering jack will appear immediately above its corresponding line signal. Each and every line shall appear in the first 6 panels, and be multiplied in every sixth panel thereafter, and sufficient room shall still remain in the jack panels to accommo-

date ultimately 1,440 lines. The subscribers lines shall be connected to jacks mounted in banks of 20.

Spring Jacks—The spring jacks shall be firmly constructed with German silver springs of such length, strength, and design as to insure the proper making and breaking of the contacts with the plug. All springs to be thoroughly insulated from each other with the best quality of hard rubber. No line contacts within the jacks will be permitted. The jacks forming the subscribers' multiple shall be mounted in banks of 20 and may or may not be numbered, a vertical narrow white line shall be drawn to the right of the fifth, tenth and fifteenth jacks in every bank. The answering jacks shall be mounted in strips of 20 and numbered in such manner as will admit of the number being readily and easily changed or transferred to any answering jack.

Line Signals—All line signals shall be 1-3 c. p. incandescent lamps and designed to make perfect electrical and mechanical connections with their bases or jacks, and fitted to slide into the latter. All line signals are to be mounted in strips of 20 and each one placed immediately below its corresponding answering jack and shall be so arranged that any lamp may be quickly and easily replaced. Suitable opalescent glass jewels mounted in brass caps, the latter flush with the front of the strip, shall be mounted in front of each lamp.

Line Relays—The line relays shall be mounted on iron strips placed on an iron or steel rack. They shall be wound to a suitable and uniform resistance with silk insulated copper wire, on insulated cores of soft Swedish iron, and shall be ironclad and so constructed as to prevent cross-talk. All contact springs shall be of German silver with riveted platinum contacts. The relays shall be sensitive enough to operate positively with 1,200 ohms in the external line circuit and with the same adjustment, when the armature is drawn up on a short circuit the armature shall release when the resistance of the circuit is increased to 10,000 ohms. They shall be so designed and constructed as to be easily removed or replaced, and each relay shall be provided with a dust-proof cap.

Impedance or Repeating Coils—All impedance or repeating coils shall be wound to a suitable and uniform resistance with silk covered copper wire, and the magnetic circuit shall be complete and composed of laminated soft iron.

Order Keys—The order keys shall be constructed of suitable German silver springs mounted in, and insulated by a hard rubber base and provided with a hard rubber plunger for operating. The contacts shall be riveted platinum points and the springs shall be of such design and dimensions as to insure long life. The key may be finished with a metal standard to facilitate mounting.

Ring and Listening Keys—Fourteen combination ringing and listening keys shall be provided for each operator's position. Each key shall be so constructed as to remain in the listening position until restored by the operator and shall automatically return from the ringing to the normal position after having been released by the operator. The key is to be pushed from the operator to listen and drawn toward her to ring. The position midway between these two shall be the normal one. The key springs shall be of such dimensions and design as to insure strength, durability and elasticity. The springs shall be insulated from each other and the key base by the best quality of hard rubber. The key must be furnished with riveted platinum points throughout and shall be as dust-proof as possible.

Plugs—The plugs shall be well and substantially made and furnished with connections for the different strands of cord. Means shall be provided for securely fastening the cord in the shank of the plug without impairing the electrical qualities of the

*Mr. Goodrum's article will be concluded in our next issue.

cord conductors. A fibre shell is to be secured over the plug after the cord has been attached.

Cords—The cord shall be 7 feet long and the conductors shall be formed of twisted tinsel and copper wire, insulated with two wrappings of silk, covered with heavy linen braids and reinforced at plug end. Proper measures shall be taken to keep the cord of a cylindrical cross section, and each conductor shall be provided with a tip which shall be soldered to the cord conductor. A safety shall be provided for taking all strain off the cord tips.

Cord Weights—All cord weights shall be of lead, iron or brass, provided with smoothly finished brass pulleys, and of such weight as to keep the cord properly taut. They shall be of such design as not to interfere with nor entangle adjacent weights or cords, nor strike the framework or woodwork of the switchboard.

Supervisory Lamps—There shall be 1-3 c. p. supervisory lamp for each cord, and said lamp shall be mounted in the key shelf in front of and in a manner to correspond to its respective cord. The lamps shall slide into their bases or jacks and shall be so mounted as to be readily accessible. The lamp shall make a firm and reliable connection with the jack or base. A suitable opalescent glass jewel shall be mounted in a brass cap over each lamp, and said jewel shall be protected by a suitable brass guard from breakage due to impact of the plugs.

Supervisory Relays—The supervisory relays shall be mounted on iron strips and placed in the rear of the switchboard. They shall be wound to a suitable and uniform resistance with silk-insulated copper wire over insulated cores of soft Swedish iron, and shall be ironclad and so constructed as to prevent cross-talk. All springs shall be of German silver and all contacts platinum points riveted. The relays shall be sensitive enough to operate positively with 1,200 ohms in the external line circuit and with the same adjustment, when the armature is drawn up on a short circuit the armature shall release when the resistance of the circuit is increased to 10,000 ohms. They shall be so constructed and designed as to be easily and readily removed or replaced, and each relay shall be provided with a dust-proof cap.

Pilot Lamp—One 1-3 c. p. lamp shall be mounted in a jack in the front of the board, above the plug shelf in each position, and shall be covered by an opalescent jewel set in a brass cap flush with the front of the board. The function of this lamp shall be to light whenever a subscriber calls, and to remain lighted as long as the subscriber's line signal is displayed in that position.

Night Bell—A bell shall be wired up to give an audible signal whenever a subscriber calls on any position of the board, and shall be controlled by a switch so that it may be cut out of service at will.

Operator's Equipment—Unless otherwise specified each operator's position shall be equipped with 14 pairs of connecting cords, plug weights, supervisory relays, supervisory lamps, lamp jacks, combination ringing and listening keys, one pilot lamp, and the necessary opal caps, guards, cord fasteners and other apparatus and wiring necessary to furnish a position complete and ready for satisfactory and continued service. Each operator's position shall be equipped with a granular carbon transmitter suspended from an adjacent transmitter arm of support by two heavy tinsel cords, covered with maroon silk; provision shall be made for taking the strain due to the weight of the transmitter, off the cord tips. One head receiver with band shall be furnished with each position; said receiver, to be connected with a 4-foot double conductor green silk cord terminating in a plug of proper design. Each position shall be equipped with two jacks mounted on the left side of the position and so wired and connected that when the plug on the receiver is inserted in either one, the receiver will be connected in the proper manner in the induction coil circuit and the transmitter circuit will be closed by operator placing head telephone plug in jack. All wiring and additional apparatus necessary for a proper talking circuit is to be provided.

Busy Test—The switchboard shall be equipped with an efficient busy test by means of which any operator shall be able to readily ascertain if any line is in use or connected at any part of the board. This test shall consist of a click heard in the operator's receiver whenever the operator touches the tip of a connecting plug with which her set is connected to the test of the jack of a busy line.

Wiring—All cables on the switchboard, toll-board, and chief operator's desk shall be made of 22 B. S. & G. tinned soft copper

wire, insulated with layers, 2 of silk and 1 of cotton, each layer to be wound reverse to the adjacent layers, and the outside cotton layer colored in some manner or code to assist in identifying each conductor. The dye used for the coloring must not impair the insulation of the wires. The cables shall be served with one layer of cotton and one of paper, wrapped in reverse directions, and a heavy braid shall be laid over all and impregnated with a fire and moisture proof insulating compound. All cable end shall be thoroughly soaked in hot beeswax before butting; they must be butted and formed in a neat, workmanlike manner, and laced with a strong, single and waxed linen twine. All special hand made cables shall be made from 22 B. S. & G. tinned soft copper wire, insulated as specified for cable wires and treated to hot beeswax, or paraffine wax before being formed into the cable. Such cables shall be laced with one strong, waxed, linen twine and shall be treated to a light coat of white shellac.

All battery wires in common shall be 16 B. S. & G. Okonite insulation, unless used for talking, in which case they must be large enough to preserve the system free from cross-talk. Individual battery wires shall be furnished for each operator's set and shall be of 18 B. S. & G. with rubber insulation. Generator wires from the power board to the switchboard shall be run with 16 B. S. & G. covered with Okonite insulation, braided and twisted in pairs. Not more than three positions shall be served from one generator circuit, and one circuit must not serve adjoining positions. Two generator leads may serve 6 positions, the odd numbered ones being connected on one circuit, and the even numbered ones on the other. The generator current shall pass through a lamp or some other form of resistance before entering the key cable. Generator wires in key cables shall consist of stranded 18 flexible cord insulated with Okonite insulation, covered with a silk braid and twisted. All generator wires and every pair of wires composing part or the whole of a talking circuit shall be twisted in pairs. There shall be no joint or splice in any cable wire in the switchboard.

First Section—The first section shall contain the full complement of subscribers' jacks and trunk plugs and operators position.

The subscriber's jacks shall be multiplied in every sixth panel.

The first and second sections shall contain the full complement of subscriber's jacks and operator's positions 0-5, each section comprising 3 positions.

Position 0 shall be drilled the same as other positions but shall not be equipped; the holes shall be covered by suitable panels of neat appearance.

Position 1 shall be wired for 30 toll lines and equipped for 15, with necessary special keys, and cord circuits to make complete for toll position fourteen pairs of connecting cords.

Position 2 to 5 inclusive, shall be equipped for 160 subscribers' lines each and 14 pairs of connecting cords and a complete talking outfit.

Circuits—The circuits to which the subscribers' positions are wired shall be such that the supervisory lamps shall at all times indicate on the line to which the respective plug is connected, whether the subscriber has "hung up" or has his telephone off the hook. The circuit shall be entirely automatic in its signalling properties and it shall be unnecessary for an operator to listen to the connection once completed, unless the subscriber should signal his desire for such an act. The toll operators shall have combination pairs of plugs, ring off drop on one side and automatic clearing out on the other with repeating coil.

The front of the board is to be equipped with a sufficient number of 16 c. p. incandescent lamps to thoroughly illuminate the board for operating. The lamps shall be placed in a continuous reflection of such design and so located as to throw the light on the multiple jacks only, and as little as possible on the line signals and key shelves. One keyless lamp socket shall be wired to the inside of the roof of the switchboard in the center of each section for use in repair work. The workmanship, wire, cutouts, switches, lamp brackets and sockets used in connection with this work shall be in strict accordance with the rules and requirements of the National Board of Fire Underwriters.

Operators' chairs—Suitable revolving chairs with backs shall be provided for each position, the toll board, chief operator's and wire chief's desks. They shall match the switchboard in finish.

Main Distributing Board—A distributing board shall be installed with sufficient capacity to meet the present requirements of the exchange and shall allow of increase to the ultimate ca-

capacity of the exchange. It shall consist of iron or steel framework assembled in a secure and workmanlike manner and shall be given a coat of good metallic paint after being placed in position. It shall provide permanent connections for all outside cable wires, and all subscribers' lines appearing in the multiple of the switchboard. Proper means shall be provided for the easy and rapid connection of any cable pair with any switchboard line by means of a jumper, and it shall also provide for the easy removal of the dead jumper wires. The wiring and cross connecting shall be made complete and ready for complete and continuous use by the contractor. A reliable and efficient form of lightning and such current arrester shall be provided and mounted on the main distributing board.

Intermediate Distributing Board—An intermediate board of the same general form of design and construction as the main distributing board is to be furnished. All subscribers multiple lines, toll trunk lines, chief operator's line, and all answering jack lines shall appear on this board in such manner as to admit of being readily inter-connected, the trunk lines together and any multiple line with any answering jack.

Relay and Coil Rack—All impedance or repeating coils and all line relays are to be mounted in suitable iron racks of the same material and finish as the distributing boards.

Underground Cables—Underground cables of 200 pairs capacity will enter the exchange and will be pot-headed and connected to the distributing board by the telephone company.

Chief Operator's Desk—A flat desk 56"x28" with a small cabinet mounted on the top for containing the necessary jacks, signals and other apparatus, the whole to be finished to match the switchboard, shall be provided for the chief operator. Provision shall be made on the desk for lamps and jacks, and other necessary apparatus for three exchange lines; one line each to the toll board and wire chief, and 3 pairs of connecting cords with the necessary ringing and listening keys, etc., no supervisory lamps are to be placed on these cords. A pair of wires shall be brought from each operator's position including the toll positions, and terminated on a spring jack on this desk connected in such a manner as will enable the chief to carry on a conversation with the corresponding operator by plugging the spring jack, and switch so arranged as to cut off transmitter battery and allow chief operator to listen without the operator being conscious of it. All necessary battery, generators and other wires, must be taken to and into the chief operator's desk subject to the same conditions governing the corresponding wires in the switchboard. The desk shall be provided with a granular carbon transmitter suspended by heavy tinsel cords from a swinging arm, and a head telephone and a 4-foot-two conductor green silk covered cord terminating in a plug, and the necessary wiring and other material to form a complete talking apparatus. The transmitter and receiver circuits are to be wired to a jack in the same manner as specified for the switchboard positions. Room shall be left in the cabinet to provide for the full number of listening and talking jacks, should the exchange grow to its full capacity. Vacant spaces in the cabinet shall be filled with ebony finished wood strips.

Wire Chief's Desk—The wire chief's desk shall be provided with 25 incoming line jacks and lamps, and 5 outgoing. The desk is to have a complete talking apparatus and 4 pairs of plugs connecting cords with the necessary apparatus and instruments properly wired up for making rapid and complete tests on any line of the exchange. Equipment to be specified by purchaser when contractor is ready.

These specifications shall include the furnishing, proper installation and connecting up of all wires and apparatus from the outgoing conductors throughout the exchange necessary for the complete, satisfactory and continued operation of the exchange and shall include all necessary cable, chutes, boxes,

racks, etc. All necessary clips on all apparatus shall be thoroughly tinned before said apparatus is mounted and resin flux only will be permitted in soldering; no acid, paste or salts shall be used for flux on any portion of the work.

The entire installation shall be made so that additions may be made at any time, and in any degree without disturbing or interfering with the wires, cables or apparatus in any manner. All cables in chutes, boxes, racks or other runs shall be neatly and securely tied in place with linen twine. All work, apparatus, and other material shall conform strictly to the rules and requirements of the National Board of Fire Underwriters.

Power Plant—A power plant complete in all respects shall be provided and connected, having ample capacity to meet the ultimate requirements of the exchange. It shall consist of one motor-generator, charging machine, two ringing generators, one power board, and one fuse board and a storage battery of necessary number of cells.

Machines—All machines shall be subject to approval by telephone company's engineer, shall be of open type and shall be of the same finished design, construction and finish as machines usually; they shall be of such output as to satisfactorily meet the demands of the exchange at the present or any future time.

The motor-generator shall be wound for a—voltage current and shall be direct connected to the charging machines, which shall furnish sufficient current at the proper voltage for correctly and satisfactorily charging the storage battery. The charging machines must be provided with soft copper gauze brush. Two ringing generators are to be provided, one to operate on a—voltage current circuit, and the other to be operated from the storage battery. These machines must furnish an alternating current for ringing 100 volts pressure and not less than 900 or more than 1,000 cycles per minute. These machines shall also furnish the necessary pulsating currents for selective party ringing, and shall be of ample capacity to meet all present and future requirements of the exchange. All machines shall be placed on substantial brick foundations, and shall operate in a quiet manner without undue heating. An automatic release starting box is to be furnished with the motor, and one for the ringing machine that runs off power main and a field rheostat is to be furnished with charging dynamo. The starting boxes and rheostat shall be of such size and type as is necessary for the proper operation of the respective machines.

Power Switchboard—The power switchboard shall be of polished marble mounted in a suitable iron or steel frame and enclosed in a suitable mahogany cabinet. Weston voltmeters and ammeters, flush type, capable of reading all voltage and currents on the power board shall be furnished; provision must be made for measuring the voltage on individual cells. A reliable type of underload and overload circuit breaker shall be used on the charging circuits. The starting boxes and field rheostats are to be mounted on the back of the board and operated by a hand wheel placed on the front of the board in a convenient location. The necessary fuses, cutouts, wiring, switches, etc., for properly protecting and readily and conveniently handling the circuits, shall be provided. All wiring, material, and workmanship shall be in strict accordance with the rules and requirements of the National Board of Fire Underwriters. The power board shall be lighted with two 16 c. p. lamps mounted in brackets with shades and placed on the upper part of the board.

Fuse Board—A polished marble fuse board mounted on an iron or steel frame is to be provided to accommodate means for properly fusing the necessary wires or leads run to the switchboard or elsewhere. The bus bars shall be of polished copper and the fuse studs must be of the same material and finish and so mounted in the marble that they will not turn when once in place.

FOREIGN CURRENTS

IN spite of the solemn warning conveyed in Mr. J. E. Kingsbury's paper on "The Future of the Telephone in the United Kingdom," as to the general unprofitableness of competitive telephony, British municipalities are taking up the telephone in opposition to the monopoly of the National Telephone Company in steadily increasing numbers. Glasgow and Tunbridge Wells

both have systems working, at Portsmouth the new municipal system is almost completed, Swansea has given out contracts for construction work while towns of the importance of Manchester, Brighton, Hull, Bristol, Huddersfield, Cambridge, Rochester and Chatham have the telephone question under consideration in a more or less active form. In some places opposition

to the municipality embarking in the telephone business arises and occasionally is sufficiently powerful to shelve the question, but as a general rule the projected competition of the corporation with the promise of a cheap service is received with enthusiasm. The success of the Glasgow municipal system has encouraged many municipalities to attack the telephone question, and it looks as if there would be a boom in municipal telephony in England very shortly. This ought to give American telephone manufacturers a good opportunity as there is very little telephone manufacturing done in England and practically none that is up-to-date.

* * *

Illustrative of the extreme animosity entertained by the English municipalities toward the National Telephone Company is the dispute waging between the company and the corporation of Hull. The National has an underground system in Hull, laid down under an agreement with the corporation which contains a clause to the effect that the company must remove its wires at any time on six months' notice. Why a telephone company should accept such an agreement is a little difficult to understand, one can only surmise that it was the best thing that could be had and that nobody imagined that the six months' notice clause would ever be taken advantage of. That, however, is just what has come about. The corporation has applied for a license to operate a municipal telephone system, and has given the company notice to remove its wires. The company threatens to shut down its whole system and leave Hull without telephone service. As the municipal service could not be ready for a year so, this would be a serious matter. The dispute, after passing through various stages, including triangular conferences between the telephone company, the corporation and the Postmaster General, is now about to be taken into the courts by the National Telephone Company and there will be another interesting telephone trial, of a very novel kind.

* * *

The telephone service of London under the new conditions of two systems running side by side with free intercommunication and "competing only in efficiency," as the Postmaster General happily expressed his policy, gives apparently no greater satisfaction than when the service was the exclusive monopoly of the National Company. Telephone subscribers of both systems are continually complaining to the papers of bad service and of a variety of other telephone grievances. The new Post Office system comes in for even more criticism than the long-abused service of the National. Our lively contemporary *The Electrical Times* says that "there is no doubt that, due allowance being made for the ignorance and impatience of the ordinary London telephone user, there is much ground for complaint," but goes on to point out that the conditions are very difficult owing to the large number of exchanges, now increased by those of the Post Office system, and the consequent preponderance of trunked connections. The Post Office system is still incomplete, moreover, and has not yet had time to get settled down into thorough working order. Consequently, Londoners must still be patient and hope for the millennium.

* * *

A contribution to the London telephone controversy which has a touch of comedy in it, is contributed by a new customer of the National Telephone Company who had considerable trouble in becoming a customer. He had ordered a telephone in May, and, like all those who at length make up their minds to have a telephone, wanted it put in at once, but he got only polite letters and hopes that the instrument might be installed by September. In June having had a hint from another telephone subscriber, he asked an official to call. "A gentleman called; it was on Tuesday, 17th of June. I asked him how long it would be before the company could promise my telephone. He replied that they would do their best, but—and the same excuses—foreshadowing September as the earliest possible moment for connecting up. I proceeded as had been suggested to me. I said, 'Well, I will not ask you for any explanations nor bother you to tell me further of the disabilities under which you labor. But if there is a telephone in my house by Saturday, and that telephone is in working order, the gentleman who calls to tell me of it will find a five-pound note in an envelope as my acknowledgment of the news.'" Money always talks, and a five-pound note in London is most eloquent and persuasive. In this case the telephone, toward which nothing had been done on Tuesday, was installed and connected at noon on the following Friday! The writer of the letter ingeniously signs himself "The Taker of a Hint," and while he may have been glad to have the hint work so well, it

seems rather a queer state of affairs when a would-be telephone subscriber has to pay a premium of twenty-five dollars, in the form of a bribe to the telephone employees, in order to have his telephone installed without unreasonable delay. Small wonder that British telephone subscribers are generally dissatisfied with the management of British telephones.

* * *

The automatic telephone exchange, of which several have been invented in this country, but only one has attained the smallest degree of practical use, has been trying for years to get a footing in Europe. Several years ago demonstrations of the working of an American automatic exchange were made in a number of European cities, but all that resulted in the way of practical work, was an experimental exchange of 400 stations in Berlin, equipped to show the German officials the capabilities of the system. In Europe, as in this country, the conditions of the telephone business have grown away from any possibility of a purely automatic exchange coping satisfactorily with the work. Consequently automatic switchboards have made even less headway there than they have here, as no real business has been done in them, while on this side of the water there are several automatic exchanges actually working. Every telephone man knows, however, that there is no such future for the automatic exchange as it advocates claim for it and that every day the practical conditions of the telephone business become more complicated, and less promising from the automatic point of view.

* * *

Considering these facts and the very general opinion of telephone men here as to the limited possibilities of automatic exchanges it is surprising, to say the least, to find a serious technical journal like the London *Electrician* publishing a table like the following as illustrative of the present status of automatic exchange in this country:

Name of Exchange.	Time in Operation.	Ultimate Capacity.	Present No. of Subscribers.
Fall River	2 years	10,000	4,000
New Bedford	2 years	10,000	4,000
Augusta	3 years	10,000	3,000
Columbus	two now in	25,000	6,000
Chicago	course of erection	100,000	25,000

The *Electrician* prefaces this highly interesting table by saying "Since that time (1898) the Automatic Electric Company, of Chicago, has been busy developing the automatic telephone exchange, and we are informed that the following exchanges of large size have been constructed in addition to several small ones of from 100 to 500 subscribers, which have been erected during the last five or six years.

* * *

A table like the above may be rather impressive for English consumption, although one might expect even a British editor to be struck by the absurdity of stating in the same table that two exchanges "now in course of erection" have "present number of subscribers" to the extent respectively of 6,000 and 25,000. Augusta is said to have been in operation for three years and to have a round 3,000 subscribers. Presumably the Augusta referred to is Augusta, Georgia, which as far as general information on the subject of automatic exchanges goes, has been struggling with an automatic exchange of a few hundred lines for the past ten years at least. In fact, the possession of a working automatic telephone exchange is Augusta's chief claim to fame. In further comment on this interesting table we fancy that residents of New Bedford and Fall River will be surprised and flattered to learn that each of those cities has 4,000 actual subscribers on an automatic telephone exchange. Truly one has to go abroad to get the real news of doings at home. Against this magnificent record of development of American automatic telephones the *Electrician* editor must have blushed to report that the demonstration of four years ago "did not lead to its permanent adoption for even one exchange, and we believe that the only result of the experimental demonstration of the apparatus in London was the erection of a 20-instrument exchange in the City Chambers in Glasgow for use in inter-communicating between the municipal offices. The exchange was found useful during the two years that it was kept in order, but for various causes the installation has not been in working order for the last two years." Poor Glasgow! And meanwhile little Augusta had a 10,000-line automatic exchange and Chicago is "erecting" one for a round hundred thousand. When will those English telephone men wake up?

The Arrester.

OPERATING AND GOVERNING AN EXCHANGE *

By A. L. TÊTU

THE subject which has been assigned to me is possible of discussion from two points of view at least, that of the statistician or that of the practitioner. It is true that both points of view are material to each other in the successful management of an exchange; but I take it that the practical features of an exchange are those which will most interest this gathering, and I will therefore proceed along these lines.

The operation of an exchange is composed perhaps of two features—the element of help on one hand, and the serving of the public on the other. The first embodies the ability to properly select, rule and educate the employee, and second, to satisfy the public from the standpoint of service and treatment, and likewise to educate the public to a proper appreciation of the possibilities of the service and the part that it can play in helping a telephone company perfect its service.

The selection of an operating force is perhaps the most important feature of the early organization, for the reason that it is the operators who are brought so constantly in contact with the public, and it devolves upon the operators to create a good or bad impression in the minds of those whom they serve.

The Independent telephone people are peculiarly fortunate in the fact that trained operators are constantly presenting themselves for employment, and much saving is therefore made in the matter of education and training. The same rules of selection, however, must apply to the trained operator as to the green applicant, and the mere fact that she may have been a successful applicant to some Bell company, is no final recommendation to her employment by an Independent company, if for no other reason than that the well known discourtesy and arrogant treatment of the Bell company's subscribers arises in no small measure from the lack of discipline existing in most of their exchanges and the indifference to courtesy to which their subscribers have been accustomed.

Therefore, the manager or chief operator, upon whom devolves the responsibility of selecting his employees, must have an eye to the selection of such applicants as to his or her mind impress him or her with having the necessary qualifications to insure the courteous treatment of its subscribers, and the *honest, accurate and rapid* handling of the apparatus.

To the trained eye, the manner in which an applicant presents herself for an interview is a safe basis on which to form an opinion as to her qualifications and desirability. The "free and easy-going" applicant might, off hand, appear to be desirable from the point of view that her nerves are less liable to excitement than those of one whose entree is marked by nervousness or timidity; but it must be remembered that while the latter difficulties can, by training be dismissed, the chances are that no training will entirely dissolve the natural difficulty of the applicant first described, the result being that in the case of the "free and easy girl," we are liable to have discourtesy and "freshness," while in the applicant who is at first timid, we may reasonably expect continued courtesy and compliance with the rules.

The proposition of operators for a large exchange is considerably different from that which treats of the operating force for a smaller exchange, and care must be taken in the selection of the employee, not only from the standpoint of the relation to the public, but from the co-relation which must and should at all times exist between themselves, at least while working under the same roof. In other words, the necessity of harmony among the employees must at all times be paramount to good service, and is a necessity which must be insisted upon if beneficial results are to be expected.

To this end, therefore, we must avoid all such characteristics in an applicant as might lead to social or religious differences, and no question of religion should ever enter into the consideration of an applicant's employment.

The first essential of a successful operator are age, voice, reach and education, so far as it is possible to obtain it. It has been proved that girls under the age of eighteen years are less desirable than women between the ages of 18 and 35. An average of perhaps twenty years will insure the greatest possibility for successful training. My recommendation, therefore, is that

in the selection of an operator, the choice should fall upon an applicant of twenty years of age. Statistics, I believe, will bear me out in the statement that more regular attendance to their duties follows the employment of girls of this age, than do those of fewer years, while the employment of a girl of greater age means the necessity of abolishing ideas that may be firmly set in her mind, and less inclination on her part to conform to new rules and conditions.

The selection of supervising operators is one which entails consideration and discretion. Particularly is this true in the case of a number of employees coming from one company to another at a given time, it being assumed that they were all on the same footing during their former employment. It has been found almost impossible to successfully supervise an exchange by such employees as may have been selected from this newly arrived at condition, not because the supervisors are not willing themselves to follow out your rules, but because the other operators are inclined to resent the new authority, and as a consequence, petty jealousies will ensue to the detriment of your service and your discipline. The inference then is that a selection of supervisors, or at least a chief operator, must be made from among strangers to the new employees.

Having settled upon the personnel of your operating force, the next question to be considered is how shall they be treated with a view to securing the best results to the company. There can be but one answer to this: "Treat them as you would have your own sister or daughter treated were she placed under like conditions." That means then what? First, that they shall be assured fair and just treatment at the hands of the officers of the company, to whom they shall have, at all times, the right of appeal in the event of a questionable decision at the hands of their immediate superior. Second, that they shall be provided with comfortable, cleanly and healthful surroundings and conveniences. Third, that they shall be made to feel that the company regards them as an important component part of its organization, and as such, that they will at all times be protected against the possible abuse of discourteous subscribers, even to the extent of removing the telephones from such subscriber's place, in the event of the abuse being continued, and be guaranteed courteous treatment by their fellow workers. Fourth, they must be made to believe that the company has an interest in them apart from the mere service which they may render, and in turn will expect from then an interest, which does not cease with the signing of the pay roll. Fifth, as a means of further engendering the loyalty and interest of the operator, she should be invited to suggest from time to time such improvements, or such possibility for improvement, of the service as may make themselves apparent to her from time to time in the ordinary course of her work, and for such suggestions, a fair amount of money should be appropriated each year; the suggestions to be considered semi-annually by a committee appointed for that purpose and awards made at the same period.

The relation of the operating department to the maintenance and construction departments, is material, for the reason that without successful maintenance and construction, successful operation is of course impossible.

We are then led to the condition which requires us to treat the men of our organization with the same consideration as we do our women, not to the point perhaps of furnishing them their luncheon, for the reason that their salaries better enable them to procure this for themselves. But the individual treatment of the male employee should differ in no way at the hands of the officers of the company from that of a woman; the paramount idea being to establish an esprit de corps, which will not only bring about a happier working relation between the several departments, but more firmly instill the spirit of loyalty to the company. The loyalty to the company in this instance means, primarily, the best results at the least possible cost, and with the idea of fair treatment instilled into the minds of our men, we are led to expect close application to their work, to the end that not only may troubles be quickly relieved, but to insure a continuance of the employment of a desirable member of the organization.

*Paper read at Louisville Convention, Oct. 28 and 29.

Opinion and Comment

SILENCE BOOTHS AT PUBLIC STATIONS

THE man who uses a public telephone station very often wishes that it were less public than it is, and we rather doubt that a woman ever consents to use a public telephone which is not protected by a silence booth. A very large proportion of telephone messages are more or less confidential and this probably applies more especially to messages sent from public stations, since those messages are very generally on purely personal matters. Now, since the invention of the telephone, the art of inferring the other side of a conversation when only one side is actually heard has made rapid strides; while many men, and all women, resent even one side of a purely personal communication being overheard, even though the listener be an apparently disinterested stranger. The boothless public telephone is open to these very real objections and inconveniences, and is not used by discriminating members of the general public for any except the most formal of communications.

The public telephone station is a great educator of telephone users and is no doubt the means of implanting the seed from which the telephone habit grows in many a steady source of revenue to telephone companies that otherwise would long have remained sterile. Therefore every possible extension should be given to public stations. But the cautious manager naturally looks askance at anything that tends to make the public station expensive, for he wants to put out many of them and feels that he can only put out many if he can put them out cheaply. To equip every public station with a silence booth would mean a serious increase to the cost of equipment and to many managers such a proposition would seem quite out of the question. This, however, is practically what we would urge. Doubtless there are situations where a silence booth is hardly required and others where the space available will not allow of one, and a public station may still do a satisfactory business in such situations. There are exceptions to every rule, but, as a general proposition, we hold that every public telephone station which is expected to do a good traffic should be equipped with a silence booth.

The proper point of view to take is not that the expense is prohibitive, but will it produce a sufficient return in net revenue? A public telephone station is meant to attract, not the regular telephone subscriber, but what may be called the floating user, the man or woman who wants to send an urgent message from wherever he or she may happen to be. Now the floating user is much more apt to be encouraged to use the telephone often if he gets always a thoroughly satisfactory service at the public station, a well-kept instrument, a prompt service, good talking, and a silence booth which renders his communication thoroughly private and confidential. There undoubtedly is a strong prejudice among the general public against using open public telephones and it is an entirely reasonable and natural prejudice. Therefore the silence booth should be looked on as a means for securing additional revenue, for increasing the earning power of the public station. The public station is a popularizer of the telephone and the silence booth is a popularizer of the public station. If the addition of a booth at a public station increases the revenue of that station the first year by an amount sufficient to pay the interest and depreciation on the booth, it is paying its way, and in the following year will be paying a profit, as telephone increases have a happy way of never standing still.

INSPECTION AND MAINTENANCE

THE inspection and maintenance of subscribers' instruments form an important branch of telephone work. One of the numerous advantages of the central energy system is that it reduces the cost of subscriber's station inspection and maintenance. In the magneto system the weak link in the chain is the local battery at the subscriber's station. In order to keep the general efficiency of the whole plant of a magneto system up to the mark it is necessary to inspect every subscriber's instrument at frequent intervals. These intervals vary according to the manager's idea of what constitutes efficient inspection and maintenance, and also to some extent according to the kind of battery used. Some managers and some batteries are content with two or three inspections a year, while other managers and other batteries exact for efficiency at least six inspections a year.

With the general adoption of the central energy system there is a marked lightening of the work of inspection and maintenance, for since there are no local batteries to inspect and maintain the principal object of the periodical inspection is gone. It is quite possible, however, to carry this decrease of work too far and to let the subscriber's equipment, through lack of proper attention, drift into a slovenly and unworkmanlike condition. It has always been considered part of the instrument inspector's work, besides observing the actual working efficiency of the instrument and batteries, to clean up the instrument generally and polish all metal parts. This not only gives the equipment an attractive appearance but is a positive hindrance to too rapid depreciation and also discourages mischievous damage. An instrument that is kept always clean and free from rust or tarnish will wear better and last longer than one which has once been allowed to lapse into bad condition, and a clean and shiny instrument inspires a respect in the user that a dirty ill-cared-for one does not.

It is poor business, then, for any telephone company to allow its subscribers' instruments to become dirty, rusty and tarnished, even though their working efficiency may be good enough to give satisfaction. A well kept-up instrument is more likely to work efficiently than one in bad external condition as poor externals are often accompanied by equally lax internals. An instrument that is always kept in good condition wears better and is worth more after a given period of service than one in bad condition. Moreover, every subscriber's instrument is more or less an advertisement of the service, and a bright and shiny spick-and-span piece of instrument is a far better advertisement than a shabby, scratched and tarnished set that looks as if it had outlived its usefulness. In a recent tour we saw a number of subscribers' stations to which this last description would apply and hence we are moved to make these remarks. To our mind smartly kept-up station equipment is an earnest of a smartly conducted service and the average member of the public doubtless gets the same impression. Consequently the conscientious inspection and maintenance of subscribers' station equipment should be insisted on by every telephone manager.

IN THE OPERATING FIELD

STRONG ENDORSEMENT FOR INDEPENDENT SECURITIES

ONE of the men interested in Bell properties, J. B. Hale, of Providence, R. I., has written a letter to the editor of *Finance*, Cleveland, in which he takes exceptions to an article on the earnings of the United States Telephone Company. The editor in reply gives a very strong endorsement of Independent properties: Mr. Hale's letter and *Finance's* reply, are reproduced below, as they are both very interesting to Independent telephone men in all parts of the country. Mr. Hale's letter is as follows:

"I notice in your last issue statement of the United States Telephone earnings for six months and estimate for year. For the six months the operating expenses seems to have taken 55 per cent of the gross, leaving 45 per cent net. In view that the average net earnings of the Bell Companies are only about 30 per cent with generally higher rates, it seems absurd on the face that other companies at lower rates can earn net 25 per cent more. The Independents have no chance of success unless they raise their rates, which they are trying to do in places where they are attempting to do a legitimate business. It seems a great pity that so much good capital will be lost in the attempt at competition, but it will be so as long as the struggle continues. The trouble is, the public does not yet appreciate what good service is, and they cannot have their cake and eat it too. The public cannot serve two masters in the telephone line. It will cleave to the best and despise the other. You ought to state in your valuable journal the true facts of the case and persuade the public from sinking more money. The Bell Company will win and serve all fairly and well."

The editor's reply is as follows:

Finance respectfully declines to advise its readers that the Bell Companies are going to wipe the Independents off the face of the earth. As a matter of fact, there have been very few Independent companies in the United States that have not made large earnings. A few failures have resulted from over-bonding and from poor construction, but these failures have indeed been few and far between, compared to the great development that has already taken place. *Finance* is a thorough believer in the future of the Independent telephone systems of this country. The statement that the Bell Companies' net earnings amount to only 30 per cent of their gross earnings is absurd on the face of it. It is notorious that the Bell Companies are over-bonded and overcapitalized. During the time when they were protected by patents their rates were so high that they were able to make enormous profits, and pay interest upon watered bonds and watered stock. They certainly could not have done this if their operation cost 70 per cent of the gross earnings.

As a matter of fact, the American Bell Company has never claimed that its net earnings were but 30 per cent of its gross earnings. In the *Electrical Review* of March, 1902, page 413, is printed a statement taken from the annual report of the president of the American Bell Company showing that for the year 1900 the operating expenses of the American Bell Company and its licensee companies was but 42 per cent of its gross earnings, leaving net earnings of 58 per cent for the year. This is an average year.

Regarding the United States Telephone Company, and the statement printed last week, it may be said that the service given by this company is of the best and will compare favorably with the services of any company operating in the United States, either Bell or Independent. The United States Telephone Company is a well built, well managed concern, and while it is not anywhere near developed to its earning capacity, it is capable of development by the expenditure of but \$100,000, which will increase its earnings fully 100 per cent. It seems absurd, even to the uninitiated, that it should cost 70 per cent of the gross earnings to operate a toll line. The business of a toll line is handled by agents of the various local companies, who charge 15 or 25 per cent for handling the business. The only other expense outside of this is the maintenance expense and the main office expense, both of which are comparatively small.

The editor of *Finance* is personally informed regarding a number of Ohio and New York Independent companies that are earning 22 per cent upon the actual money invested, and this 22 per cent is net after a goodly sum has been paid out each year for maintaining the plants.

The man who invests his money in an Independent telephone company that is constructed properly and is not overcapitalized will not lose money, but will certainly make money if he buys at the right figure. The Bell Telephone Company will not win out in the struggle that is now going on in the telephone field, and one of the main reasons why it will not win out is because of the

fact that the Bell plants are old, and they are burdened with watered stock and watered bonds. The Independents to-day are able to buy just as good apparatus as the Bell. Go into almost any town in the United States where there has been competition between the Bell and the Independents within the past five years, and you will find the Independents doing twice to five times the business that the Bell Company is doing, and giving service equal to, if not better, than the Bell service.

FEDERAL TELEPHONE AFFAIRS

THE new president of the Federal Telephone Company, F. S. Dickson, has just got back from an inspection trip of the properties of the company. He announced that all of the properties are in fairly good condition, but that each one requires considerable new money for development and extensions. This money will be furnished at once, and all of the Federal properties at once put in first class condition, as they all have more business than they can take care of.

Owing to the fact that the Cuyahoga plant would only find itself burdened with losing business if extensions were made and new business gone after on the present charges for telephone service, President Dickson reports that no money will be spent on the Cuyahoga plant until the Cleveland city council grants permission to raise the rates. He thinks that Cuyahoga can be made a very profitable property, providing the council will allow the raising of rates. The money can be secured to develop the property just as soon as the necessary permission can be obtained from the council for the change in the rate schedule, but this permission cannot be granted until after the April election, owing to the fact that the present council is restrained by the Supreme Court from transacting any business relating to franchises.

The People's Telephone Company of Detroit, which is one of the Federal properties, has asked the Detroit council to grant an extension of the time for the completion of the plant, as the franchise has now practically expired.

A rumor was circulated recently by the enemies of the People's Company to the effect that Federal officials were negotiating with the Bell Company for the sale of the Ohio and Michigan properties of the Federal.

J. B. Ware, who represents the Federal at Detroit, wired Mr. Dickson at Findlay giving him the particulars of the rumor, and asked that he make some statement. Mr. Dickson sent the following reply:

"Report that Federal Telephone Company officials are in conference with Bell interests in Chicago or elsewhere relative to disposing of Federal property to the Bell Company is absolutely without foundation. Federal officials are now with me in Findlay inspecting properties in this section of the State with a view to their continued development on an Independent basis."

This announcement, coming as it did from Mr. Dickson, effectually quelled all further rumors as to selling out to the Bell.

ILLINOIS CENTRAL TELEPHONE SYSTEM

PRESIDENT STUYVESANT FISH has just closed an extended tour of inspection of the lines of the Illinois Central Railroad system, of which he is the head. Of the many improvements that are now under way or which have been recently completed the president took most interest in the extension of the use of the telephone for the purpose of facilitating train dispatching and other business connected with running trains.

The Illinois Central now has telephone lines connecting Chicago and the principal offices to Cairo on the south and to Omaha on the west. It is the intention to as rapidly as possible put other lines in telephonic communication throughout their length.

President Fish, though living in New York city, has been connected with the Illinois Central for so many years, and has made so many visits to Chicago and every part of the great railroad system that he is thoroughly in touch with the spirit of the west.

On the trip he made personal use of the telephones at one or two points for the purpose of securing a personal knowledge of the effectiveness of the system.

CONTEMPORARY CROSS TALK

IN attacking a problem, as in attacking in actual warfare a position held by the enemy, it is correct practice to reduce the outer works first. Proceeding on those principles let us see what we can do with the subscribers in our endeavor to cut down the time occupied in operating the average telephone message. All telephone subscribers clamor for a quick and efficient service, but very few telephone subscribers realize how much they have to do themselves with making the service quick and efficient or the reverse. Unfortunately, too, there are comparatively few telephone managers who realize that the subscribers of a telephone system are themselves also the operators of that system. If all telephone managers were fully alive to this important fact—one of the many peculiar conditions that surround the working of the telephone—there would be much more general and determined effort than is now made by telephone companies to educate telephone subscribers in the proper use of the telephone and to impress upon them that to them belongs a large share of the responsibility for the efficiency of the service.

* * *

We have assumed in this discussion that the use of the central energy system, which so much reduces the subscriber's opportunities for bad operating, is practically universal—which of course it is not. And, in any case, the central energy system is only some four years old, whereas the magneto system, with all its opportunities for inefficient and obstructive operation by the subscriber, is almost as old as the telephone itself, and is really still very largely in use. Yet no systematic work is ever done or ever has been done thoroughly to educate the subscriber in the proper use of the service, or to bring clearly and persistently before him how great an influence his own work has on the service he receives. A general knowledge of the working of a telephone system has gradually disseminated itself among telephone users, but human carelessness is so general, human ignorance so dense and human selfishness so supreme, that a thorough understanding of the working of a telephone connection from one end to the other is not possessed by one telephone subscriber in a thousand. Many telephone subscribers give numbers from memory and give them wrongly, or transpose the numbers from sheer carelessness; many insist that no number they call can ever be "busy;" many delight in grinding a generator for minutes at a time under the impression that they are ringing a bell at the operator, many make no effort to answer a call promptly, letting the bell ring for a minute or so before they flick down the receiver and growl out a surly "hello."

* * *

The telephone subscribers who commit these and other sins against the very efficiency that they so urgently claim from the telephone company, ignore entirely the reciprocal and co-operative nature of the telephone service. The man who carelessly gives wrong numbers forgets that he is wasting the time of the operator and of his line, and also that of another subscriber and his line, and that by being careless and slapdash in his methods he is encouraging others also to be so and in turn to annoy him and to waste his time. The same thought might occur to him, but presumably does not, regarding the prolonged rings and the slowness in answering the bell. If he is habitually slow in answering and so wastes the time of his correspondents, others will be slow, too, and in his turn his time will be wasted. These reflections are so elementary that it would seem they might occur to any practical person, yet there are comparatively few telephone subscribers so practical as to apply them consistently and be guided by them in their daily and hourly operation of the telephone.

* * *

Going a little deeper, which the average telephone subscriber could hardly be expected to do for himself, it is clear to a telephone man that the various faults committed by the subscribers and their general lack of efficiency must greatly add to the work of the operators and largely increase the time that the lines are employed uselessly. In this way the effect of bad operating on the part of the subscribers is cumulative, for not only is the service made bad for the one or two immediately concerned by some careless, slow or obstructive piece of operating on the part of a subscriber, but the operator's time is occupied unprofitably, withdrawing her attention from other calls, and since these are delayed others in turn will also be delayed, until a slack time comes

and equilibrium is restored. Every delay means unnecessary use of a line, sometimes of two, often of two subscribers' lines and a trunk line; as every line is "busy" from the moment it is connected, it is clear that any unnecessary delay simply means that the lines affected will be "busy" for a certain length of time when they are not really being profitably used, when no actual conversation is going on, but there is simply a waste of time due to carelessness, obstruction or slowness on somebody's part.

* * *

Now, consider for a moment what a train of trouble this may bring about. Say A has called for B and the lines are connected, but B fails to answer promptly, delaying say fifty or sixty seconds. A few moments before they finish D calls for A and is told "busy," and X calls for B and is told "busy." Failing to get A, D calls another man, and as soon as A gets clear of B he calls D, only to be told "busy;" A disputed the busy report and so keeps his line "busy," blocking calls for himself, and so on, *ad infinitum*. The great trouble in any actively used telephone system is the frequency of the "busy" report. Every "busy" call means so much time of the calling subscriber, of the operator and of the line absolutely wasted. Every line is "busy" from the moment the operator plugs into it and remains "busy" until the plug is taken out. If there is much slow work there will be much time when the lines are "busy" and yet are not being used effectively, and, as we have seen from the very simple example above, the effect of this is cumulative and wide spreading. If A and B had been smart over their connection D would have got A promptly and X would have got B, and much time would have been saved to subscribers, operators and plant.

* * *

Some telephone users, even some telephone men, might think that we were splitting hairs in analyzing the working of a telephone system so finely. But the real telephone man knows that his continuous occupation is the splitting of hairs, and it is only by the ceaseless, accurate and successful splitting of hairs that good telephone work is done. All telephone work is dependent on the accurate handling of a mass of details, and every detail must be perfect in order that the whole may work harmoniously and successfully. As regards telephone apparatus and exchange plant this is too obvious and familiar a fact to need any discussion. A misplaced screw among thousands of screws, a bent spring or a bad contact in any one of a hundred places may put a hundred-thousand dollar line temporarily out of business. In the same way, the operation of every telephone connection is made up of a number of detailed operations, to be performed partly by the subscribers and partly by the operators, and unless each one of these detailed operations is accurately and swiftly performed it is hopeless to expect the whole operation to be accurate and swift. And unless the large majority of connections are accurately and swiftly made we do not get what every telephone man worth his salt desires to give and what every telephone subscriber without exception demands—a rapid and efficient service.

* * *

The great defect of the average telephone subscriber, from the telephone working point of view, is that from which most of us suffer more or less, generally more than less, *viz*, that we make no attempt to put ourselves in the other man's place. Now the telephone subscriber, in the use of the telephone, is from the very nature of things continually putting himself in the other man's place, but most unfortunately he seldom recognizes this and rarely does unto others as he would be done by. One moment he is the caller and he fumes at any delay in getting an answer to his call. The next moment he is in the reverse position, someone calls him and he calmly goes on with whatever little job he may be engaged in, while the telephone bell rings steadily and patiently. If every telephone subscriber thoroughly realized that from the moment the bell begins to ring he is, by not answering promptly, keeping another subscriber waiting at the distant end who will infallibly, if the bad example of slow answering is set, keep him waiting in turn when the order of the call is reversed, there would be a marked reduction in the average time of the subscribers answer to the call after the connection is completed.

* * *

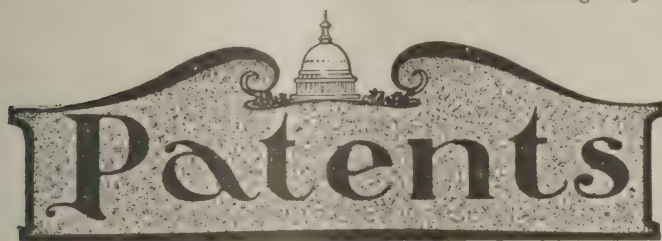
In some telephone systems it has been the practice to discipline

subscribers into answering quickly by giving only one or two rings and then, if no answer was obtained within a given period, of reporting to the calling subscriber that the number wanted did not answer. The subscribers, being informed that this practice would be adhered to, became much smarter in their operation of the service than they had previously been, and the call of the telephone bell was more seriously and promptly attended to. In another system the practice was to ring once only and then to disconnect without listening in whenever the clearing-out drop fell, even when the operator could tell almost to a certainty that the clearing out drop was thrown by the calling subscriber trying to ring up his correspondent.

* * *

But in a message rate service it is the telephone company's object to secure completed connections, since the completed connection constitutes the message and the message is what is charged for. Under a flat rate it makes no difference to the telephone company whether the subscribers really get into communication with each other or not, as long as the company efficiently performs its work of giving them the facilities for getting into communication; and the company is fully justified in throwing upon the subscribers the responsibility of using those facilities correctly and smartly. Under message rates, however, the telephone company is interested in making sure that a completed connection results in an actual conversation, and where the telephone user is paying by the message he would naturally rebel at methods that he would submit to without a murmur when he paid by the year.

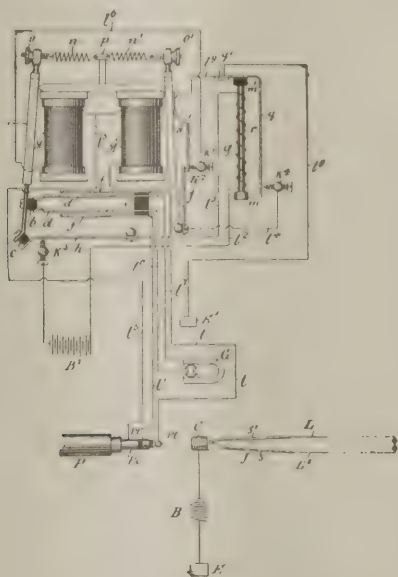
The Listening Key.



Thomas M. Thomson, County of Middlesex, England, patents (No. 712,619, Nov. 4, 1902,) an electrical relay. The object of this invention is to provide an attachment to be used in connection with the ringing apparatus of a telephone exchange

The device is used in conjunction with a power generator, or other type of automatic signalling apparatus, and is so arranged that the insertion of the plug of a cord circuit into a jack on the

Fig. 1



switchboard energizes a magnet which throws the ringing current on to the line by means of the armature operating on the necessary springs. At the same time a contact is made, closing the circuit of a local battery, which operates on a timing device. After a certain period of time a second contact is made by the operation of the timing device, and a second magnet is energized which so operates as to open the circuit of the first magnet, thus interrupting the connection between the ringing apparatus and

the line, and also disconnecting the local battery from the timing device. When the plug is removed from the jack the apparatus resumes its normal position, and a second call can be given by the same operation.

As shown in the drawing, Fig. 1, the current from the earthed battery B passes through the jack sleeve to the plug, and thence

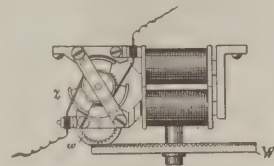
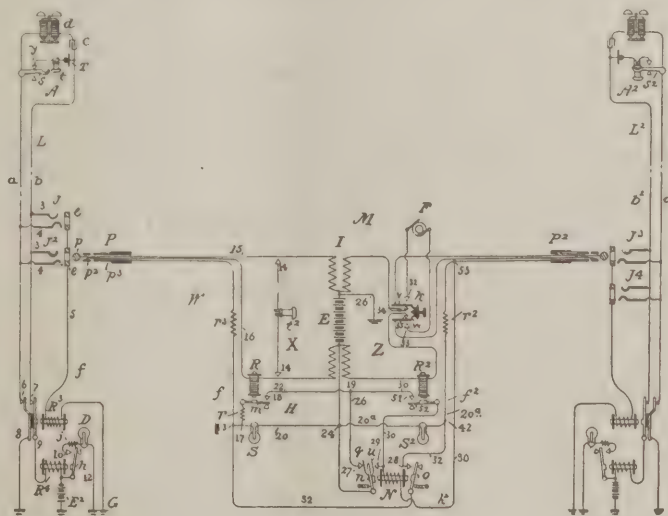


Fig. 6

through the magnet M to ground operating the armature a. This throws the ringing current onto the line and at the same time closes the circuit of the battery B¹ at the contact K², which allows the current to pass through the timing device. In Fig. 1 this is shown to be of the thermostat principle, consisting of a rod r, of metal or ebonite, fastened at one end and surrounded by a coil of high resistance wire g. The heat produced by the coil causes the rod to expand longitudinally, making a third connection at K³, this period of time being adjusted according to requirements. This connection throws the magnet M¹ into the circuit and its armature opens the contact at K¹, thus cutting off the battery from the magnet M and the heat coil g. At the same time the contact at K² is made, which keeps the magnet M¹ in service till the plug is removed from the jack. In place of the heat coil being used as a timing device, a clock-work attachment can be used or a self-starting motor, as shown in Fig. 6.

D. S. Hulfish, of Chicago, Ill., patents (712,801, Nov. 4, 1902) and assigns to the American Telephone and Telegraph Company a switchboard and supervisory circuit. This invention relates especially to the apparatus used at the central stations of telephone exchanges for supervising the connections and disconnections between the various subscribers.

In addition to the usual combination of line, lamp and cut-out relays, there is an extra relay shown in the drawing at N. The object of this device is to cause both clearing-out signals to be displayed simultaneously, when one or both of the connected subscribers hang up the receivers, thus preventing any possibility of confusion. When the calling plug is inserted in the jack preparatory to ringing for the desired party, current passes through the relay N by means of the contact at 51, being closed by action of the relay R². The action of this relay N causes connections to be made at u and at 28, and at the same time breaks the connection at q. The contact at u supplements that at 51, and the relay N remains energized independent of the action of relay R². Also a



shunt is formed around the lamp S from 24, through contacts u, 51, and 18 to 17, and the same shunt continues in from 17, through contact 28 to 42, thus operating lamp S² in parallel. The connection at q being open, the two contacts at 13 and 51 are in series, thus when a receiver at one of the connected stations is replaced both signals, S and S², will be displayed, as both the shunts will be disconnected. When the plugs are removed from the jacks the relay N returns to its normal position, and the signals are extinguished in the usual manner.



New Companies

MARION IND.—The Home Telephone Company has been incorporated by E. H. Neal, Fred Schrader, C. H. Holson, N. G. Woodward and K. V. Haymaker. The Home Company is to build an exchange in Jonesboro and Gas City in conjunction with the United Telephone Company, of this city.

WEST COLLEGE CORNER, UNION COUNTY, IND.—The Home Telephone Company of West College Corner has been incorporated, with a capital stock of \$4,000. Incorporators: Charles Stout, J. C. Barkery and W. H. Hawley.

CRESCO, IA.—The Plymouth Rock Telephone Association has been incorporated, with a capital stock of \$2,000. Incorporators: Geo. R. Seafs, N. Olsom, W. Gager, Elmer Gager and Nels Henderson.

EMMETSBURG, IA.—The Palo Alto Telephone Company has been incorporated, with a capital stock of \$25,000, to build a county telephone system.

HEBRON, ME.—The Hebron's Home Telephone Company has been incorporated, with a capital stock of \$1,800, of which \$1,200 has been paid. J. L. Bumpus is president and W. H. Berry treasurer, both of Hebron.

AUSTIN, MINN.—A meeting of those interested in the organization of a new telephone company held here recently resulted in the election of J. L. Gulden as chairman and James M. Keenan, clerk. The question was thoroughly discussed. A committee consisting of the following was appointed to investigate the needs of a new system and report at a future meeting: Jacob Weisel, A. W. Wright, R. E. Shepherd and Al Smith.

NEWTONIA, MO.—The Uneeder Telephone Company, of this place, has been incorporated to build a line from here to Granby, Rocky Comfort and Picner, with a capital stock of \$3,500, one-half paid. Incorporators: G. W. Harrison, J. W. Lansford, D. N. Dabbs, Ira Bell, J. A. Hudson, D. P. Weems, Ed. Haas and others.

JOANNA, PA.—The Hay Creek Valley Mutual Telephone Company has been organized here. The officers are: President, Dr. E. R. DeLong; vice-president and secretary, H. G. McGowan; superintendent and treasurer, E. M. Zerr; directors, J. R. Langner, Dr. Geo. Hetrick, Birdsboro; James McGowan, Chas. V. Geiger, William Bunker, Jos. D. Slichter, Samuel C. Hohl, Geiger's Mills; J. D. Mountz, Beckersville; H. C. England, Reading.

LETCHER, S. D.—William E. Ryan, Edward Welsh and others have incorporated the Letcher Telephone Company, with a capital stock of \$10,000.

QUANAH, TEX.—The Quanah and Mangum Telephone Company has been incorporated, with a capital stock of \$5,000, by M. M. Hankins, J. E. Woolbright and M. R. Smith.

ST. PETERSBURG, VA.—There is again a rumor here that a new telephone company will be organized to compete with the consolidated companies here, which have threatened to raise rates.

BRISTOL, WIS.—The Bristol Telephone Company has been incorporated, with a capital stock of \$4,000. Incorporators: F. E. Stevens, J. A. Rowbottom, C. L. Marsh.

Legal

MUSKOGEE, I. T.—The decision of the Supreme Court in the case of the Muskogee Telephone Company vs. Hall et al., involving the right to telephone franchises in the Creek Nation, has been decided in favor of Hall. The Muskogee Company claimed the right of exclusive franchise granted by the Creek Council, and brought an injunction to prevent Hall putting in a telephone system at Tulsa. The case has been in the courts three years, and the decision of the lower court was affirmed, holding that the Creek Council did not have power to grant an exclusive franchise.

Financial

FOREST CITY, ILL.—The capital stock of the Forest City Telephone Company has been increased to \$5,000, the present capital stock, \$2,500, being insufficient for the requirements.

LAFAYETTE, IND.—The Lafayette Telephone Company has mortgaged its plant and franchises for \$150,000 for the purpose of installing a common battery multiple system. The Lafayette Loan & Trust Company is trustee for the bondholders.

LOUISVILLE, KY.—A mortgage for a million dollars to cover a bond issue has been executed by the Independent Long Distance Telephone and Telegraph Company. The mortgagee is the National Trust Company, as trustee for the bondholders. The purpose of the bonds is to raise money to extend the lines in this and other States. The mortgage covers property in Kentucky and Indiana, including the Home Telephone Company's plant in this city. The issue is to be thirty-year 5s, divided as follows: Two hundred at \$100, 160 at \$500 and 900 at \$10,000.

GRAND RAPIDS, MICH.—Stockholders of the Citizens' Telephone Company have been requested to give authority to James M. Barnett, Lester J. Rindge and Ernest A. Stowe to sign amended articles of association for the purpose of increasing the authorized capital from \$1,000,000 to \$2,000,000, and to increase the directory from ten to eleven members. The purpose of increasing the capital stock is to allow of the company widening its field of operations. The condition of the company at present is highly satisfactory and on a firm basis. The new capital will be used for extensions and acquiring other Independent exchanges.

NORWALK, OHIO.—The Local Telephone Company has filed a certificate increasing its capital stock from \$250,000 to \$400,000.

Elections

LANCASTER, N. Y.—The Lancaster Telephone Company has elected the following officers: President, Charles W. Fuller; vice-president, Dr. John G. Miller; secretary, W. D. C. Moore; treasurer, George P. Zurbrick.

SHERMAN, TEX.—The annual meeting of the Grayson County Telephone Company was held here recently. The following officers were elected: Directors: James King Duffy, Walter R. Richie, C. D. Crites, Russell S. Legate, George S. Murphy, Edward Christen and J. S. Brailley. The directors elected the following officers: J. K. Duffy, president; Edward Christen, vice-president; C. D. Crites, secretary, and W. J. Richie, treasurer.

GRAFTON, W. VA.—A meeting of stockholders of the Consolidated Telephone Company was held here recently. Directors were elected for the ensuing year as follows: John I. Alexander, Charles E. Manley, E. F. Hartley, B. F. Bailey and Charles Pride. They will hold another meeting soon to reorganize.

Franchises

AURORA, ILL.—The Inter-State Telephone Company has applied to the village board of Bartlett, southeast of Elgin for a franchise. A special committee is considering the proposition and will soon report to the board.

PAXTON, ILL.—At the next session of the city council the franchise for the Dix Telephone Company will be taken up and acted on.

TAUNTON, MASS.—The Taunton Telephone Company has asked the Board of Selectmen of Attleboro, Mass., for a franchise to operate a telephone system in that town.

Combinations

HUMBOLDT, IA.—The Humboldt County Mutual Telephone people have completed a deal whereby the Humboldt exchange passes into their hands. The mutual line wires that were tied on a post at the edge of the corporation, have now been extended into town, and as soon as possible the Humboldt exchange will be attached to the Mutual line and Humboldt subscribers given the benefit of the entire county circuit. There may be some difficulty in securing the right to use the Bell Company's switchboard, and in such case the Mutual people will put in one of their own. The Humboldt County Mutual Company has enjoyed a phenomenal growth since its inception a few months ago, and now embraces nearly the entire county.

THE WEEK'S MESSAGES *Continued*

It is a result of the consolidation of all the rural lines in Humboldt county, and its strength is only gauged by its size. In Renwick this company has over seventy telephones in operation, and a total of over 500 miles of wire is already strung in the county. The company uses metallic circuits, and gives its subscribers the best to be had.

MENDON, N. Y.—The Inter-Ocean Telephone Company, of Buffalo, has bought the Home Telephone Company, and is extending a line to Victor.

Underground

DANVILLE, ILL.—The Danville Telephone Company has submitted an ordinance to the council asking for the renewal of its franchise to run for thirty years after the old one expires. In return, it promises to construct and maintain a complete conduit system, reserving the right to sublet conduits to other electrical companies.

LE ROY, N. Y.—The council has ordered all the telephone wires placed underground.

LACROSSE, WIS.—The Lacrosse Telephone Company is putting all its wires here underground. It proposes to keep at this work, until they are all in conduits.

SUPERIOR, WIS.—The People's Telephone Company has asked for a permit to place more of its wires underground. It is extremely probable that the Bell Company also will ask to place its wires underground, thus making a compulsory ordinance unnecessary.

Construction.

PASADENA, CAL.—The bonds of C. B. Frase, representing the Home Telephone Company, of Los Angeles, for the performance of the contract in which he entered with the city of Santa Anna for the construction of a new telephone system, have been filed. He agrees to expend \$16,000 for the installation of the new system within the next two years. He will spend \$4,000 of this within one year.

FORT WAYNE, IND.—The National Telephone Company is making preparations whereby every village in Allen county will have telephone facilities. A line is at present building from Fort Wayne to Cedarville, Leo, Graybill and Maysville, and as soon as it is completed another will be begun to Academic.

FREDERICK, MD.—The United Telephone Company, which recently absorbed the Maryland Telephone Company, of Hagerstown, has awarded the contract for 600 poles to be used in building the new line from Boonsboro to Frederick.

LONACONING, MD.—The Western Maryland Telephone Company, of which D. R. Sloan is the moving spirit in this section, is pushing its new line along very rapidly, and will soon be able to put the many telephones in service that have been contracted for by the citizens of this city.

TAUNTON, MASS.—It is understood that the Taunton Telephone Company is planning, in making its Mansfield connections, and if it gets a location in Attleboro to extend into North Attleboro and probably to develop the Wrentham exchange so as to have a large circuit of exchanges.

BAY CITY, MICH.—The Northwestern Telephone Company is rapidly extending its line along the shore, and has now gotten over half way between Tawas and Alpena. The line is expected to be completed to Alpena in a short time. Three more pairs of wires will be strung between here and Tawas.

FREMONT, NEB.—At a recent meeting of the directors of the Fremont Telephone Company a definite proposition for connecting with the Farmers' company was agreed upon. The proposition will be offered to the officials of the Farmers' company. It has also decided to issue an additional \$10,000 worth of stock, and Manager Henry has been instructed to order immediately the necessary material to build forty miles of rural lines into Saunders county and toward Valley, and on other contemplated routes. The manager reported satisfactory progress in the construction work here in the city, and that about five hundred poles are already set.

CANTERBURY DEPOT, N. H.—Work has been commenced on the Citizens' telephone line between East Canterbury and Belmont.

ELLISBURG, N. Y.—A telephone line is being constructed from here to Belleville. The line starts at Lowville and will be extended this fall by way of Port Ontario to Oswego.

RAWSON, O.—The People's Telephone Company is building a line south of town. It expects to come into town and build north and west, also to put in an exchange here.

SPRINGFIELD, OHIO.—Bids for the construction of the exchange for the Springfield Zenia Telephone Company have been opened. The building will cost about \$10,000. The front will be of Roman pressed brick with Indiana limestone trimmings. The style will be Italian renaissance, and the dimensions will be 37 x 67 feet. It will have two stories and basement.

GERMANTOWN, PA.—The Keystone Telephone Company has bought a lot here, size 43 x 80 feet for \$1,900. It is understood that the company will build an exchange on this lot to take care of the business of this district.

GREENE, PA.—The Andrew Mutual Telephone Company, of Millville, is building a line into this township. The route has been laid out, and will start at Waterford and go through Bunnel's Corners and through West Greene, where there are fifteen subscribers, to Weed's Corners, where it will extend northeast. That much of the line will be completed this fall and next summer the line will be extended to Phillipsville, Lowville and Wattsburg, and branch lines will run to Hammett, Kuhl and other nearby places.

DENISON, TEX.—James K. Duffy, president of the Grayson County Telephone Company, says that his company is constructing a line through Indian Territory, via Denison, and will build it into Kansas City and St. Louis, and have connections with all points north.

ARGUS, S. D.—Manager Ege, of the local system, has made arrangements for extending the system half way to Lenox, where connections will be made with an extension the Lenox Company is building.

DANVILLE, VA.—Danville is to be connected at an early date with Martinsville and South Boston by long distance telephone.

KENOSHA, WIS.—Plans are now well under way for the construction of a new independent plant here. W. C. Heinroth, of Chicago, is here. The new company will ask for a franchise at the next meeting of the council.

Miscellaneous.

BYRON, ILL.—The stock for the Byron Telephone Company has all been taken, and the work of construction will soon be commenced. Two-thirds of the stock will be held by home parties.

CARBONDALE, ILL.—The Carbondale Telephone Company has taken charge of the telephone exchange in this city and its tributary lines. The board of directors of the company is composed of Judge O. A. Harker, W. A. Schwartz, Dr. D. B. Parkinson, J. B. Bundy, D. M. Parkinson, L. B. Rapp, George M. Harker and Mrs. Butler. The officers are: President, D. M. Parkinson; secretary and general manager, J. B. Bundy, treasurer, George M. Harker.

COON RAPIDS, IA.—An amendment to the articles of incorporation of the Harris-Jewell Telephone Company has been filed, changing the name to Coon Rapids Telephone and Electrical Company.

GRAND RAPIDS, MICH.—Secretary E. B. Fisher, of the Citizens' Telephone Company, has returned from Traverse City, where he made an inspection of the exchange of that place. He was greatly pleased with the prosperous condition of the plant, which has grown vigorously since the Citizens' company came into possession of it. During October there were fifty-three new telephones installed and the business is increasing at the rate of three a day. A switchboard with a capacity of 100 lines was placed, and this was practically filled in six weeks. The exchange now has in operation 860 telephones. Its system is very complete, and its underground and overhead lines will enable it to care for its rapidly increasing business for some time to come. The final papers of formal transfer of the Mason-Ingham county exchange have been completed. This places the Citizens' company in legal control of this exchange, which was formerly a branch of the United States Telephone Company. The Citizens' Company has operated the exchange since October 1.

VERNON, N. Y.—The Independent Telephone Company has its exchange established and in operation in this village, and connection may now be had with Verona Center, Knoxboro, Augusta, Oriskany Falls, and other villages through that section.

GAINSBORO, TENN.—The Gainsboro Telephone Company has established communication to Cedartown over its new line. It is greatly improving and extending its service in all directions.

Personal

ALMA, MICH.—Thos. Bromley, Jr., has resigned his position as secretary and manager of the Union Telephone Company, to accept the management of the Delaware and Madison County Telephone Company, with headquarters at Muncie, Ind. Mr. Bromley has by his straightforward manner and strict attention to his duties since assuming his position in Alma, won the admiration of his associates in business and the friendship of all who have come in contact with him. At a meeting of the directors the resignation was accepted by the Union Telephone Company, and the position made vacant was tendered to J. H. Fildew, of St. Johns.

HANOVER, PA.—Cameron L. Baer, of Harrisburg, former wire chief in the telephone exchange of that city, will be the new manager of the United Telephone and Telegraph Company, at Hanover.

MORE APPARATUS FOR PURDUE

THE telephone manufacturing and supply houses are doing the handsome thing by Purdue University. In addition to the list of apparatus enumerated in the AMERICAN TELEPHONE JOURNAL recently, the Kellogg Switchboard and Supply Company, Chicago, has just sent in some very valuable suggestions and apparatus. Among the apparatus donated by the Kellogg Company was a complete equipment of its standard subscriber local and common battery circuits, besides standard trunk apparatus, and all equipment, such as numerous instruments, plugs, cords, cord tips, binding posts and many supplies necessary to the successful organization of a good laboratory. It also has sent many blue prints and helpful suggestions as to the organization of a laboratory founded on useful and commercial lines.

TRADE NOTES

THE W. G. NAGEL ELECTRIC COMPANY, of Toledo, is receiving a large number of orders for its "Ready Duct Rods" which it recently put on the market. These rods, owing to their construction, can be coupled or uncoupled in any position, especially in a horizontal, which will appeal to all underground workers. "Ready Duct Rods" cannot become uncoupled while in duct, castings are made of malleable iron, rod of one inch, growth ash or hickory. The Nagel Company has its number 2 bulletin on wires, ropes and cables, now ready, and will mail a copy upon application.

JAMES S. BARRON AND COMPANY, New York, are the agents for "Carrara," a paint especially adapted for all kinds of telephone and electric work, where there should be no corrosion or oxidation. For use around storage batteries this paint is particularly excellent. This paint is made in all colors and also white. The white paint is guaranteed to be always white, and the colored paint to not fade. The following companies use Carrara paint: Kellogg Switchboard and Supply Company, Orville Telephone Company, Chicago Telephone Company, Central Union Telephone Company, Western Electric Company, and many others. James S. Barron and Company will mail a folder of 50 samples of colors and prices to anyone interested.

THE KELLOGG SWITCHBOARD AND SUPPLY COMPANY, Chicago, has been awarded the contract for apparatus for the municipal telephone systems for St. Petersburg and Odessa, Russia. The St. Petersburg contract is the largest ever awarded to any telephone manufacturing company. The switchboard is of the two division, lamp signal, full common battery type. It will have an ultimate capacity of 40,000 lines and a present equipment of 12,000. The order also includes 12,000 telephones. There is yet no definite information as to the size of the equipment for Odessa, but it is also probably very large, the city having a population of 400,000. All apparatus to be furnished will be of the latest Kellogg type. The Kellogg Company had as competitors for this contract, the Western Electric Company, Chicago; the Siemens and Halske Company, Berlin; the Mix and Genest Company, Berlin, and the Ericsson Company, of Stockholm and St. Petersburg.

G. H. MORGENSTERN, manager of the sales department of the CHICAGO PAY STATION COMPANY has recently made an extended tour of the Independent telephone field. He devoted much attention to discovering the trend of sentiment in regard to measured service. In an interview, he had the following to say as to his observations:

"Telephone officials throughout the country," said he, "are beginning to appreciate the fact that they are giving 'something for nothing' and are now beginning to 'put on the war paint' for the purpose of going after the abusers of telephone service. This is very noticeable in the smaller exchanges where the flat rate has been adopted and permission granted to non-subscribers to drop into any drug store or similar place accessible to the public for the use of the telephone.

"In some cases," he continued, "I have noticed that a few of the druggists are placing an extra set of instruments in their place of business for the sole purpose of allowing outsiders to use them for what business they might gather through this source. While this may benefit a few, the majority of telephone

subscribers who rightfully are entitled to service suffer, for the reason that the abuse of the telephone line slows the service to such an extent that vigorous 'kicks' are frequently registered. There is only one way to meet this situation. That is by the generous use of pay stations, making it necessary for outsiders to deposit the proper amount for telephone conversation. This will, of course, eliminate to a large extent the abuse mentioned and people will become accustomed to paying for service rendered. For instance, if the Western Union Telegraph Company had adopted the rule to allow its patrons to send messages of indefinite length for a flat rate, what would be the result? Is it not reasonable to suppose that the telephone business should be conducted on the same basis, namely, a measured service. This will educate the people to use the telephone when it is absolutely necessary and pay for same according to use, which will be, as a whole, more satisfactory to all interested. The operators will realize that they are handling only such business as means a revenue to the company by which they are employed; the subscriber will realize that if he cannot get a certain party it is a matter of importance to some one entitled to service and he will patiently await his opportunity to talk to the party; and the telephone company will realize that when a line is in use they are deriving a revenue."

PLANTS FOR SALE

Advertisements under this head \$1.00 for 25 words or less for each insertion. Prepaid.

FOR SALE—One of best equipped telephone exchanges in Kansas; price, \$22,000; upon which amount plant now NETS 23 per cent. If you mean business, address X for particulars, care of AMERICAN TELEPHONE JOURNAL, New York.

TELEPHONE PLANT FOR SALE—160 telephones, 100 miles of toll lines; excellent opportunity for extending business; will sell for \$12,000; pays 15 per cent. net on this amount. Address TELEPHONE CO., care of AMERICAN TELEPHONE JOURNAL.

WANTED

Advertisements under this head, 25 cents for 25 words or less for each insertion. Prepaid.

MANUFACTURERS: An engineer, experienced in designing common battery apparatus, and with excellent references, desires position with a good telephone manufacturing company. Address ENGINEER, care AMERICAN TELEPHONE JOURNAL, New York.

TRANSFER BOY, age 18; nearly two years' experience, wants position in exchange of 150 to 500 subscribers Western town preferred. Address TRANSFER, care AMERICAN TELEPHONE JOURNAL, New York.

POSITION WANTED as troubleman. Fully understands line, switchboard and instrument work. Good references. Address B. L. FAYETTE, Nappanee, Indiana.

POSITION wanted as troubleman or lineman; steady work desired by young man; references given by former and present employer. Address WM. H. DIGGINS, Care Box No. 8, Woodstock, Ohio.

EXCLUSIVE handling of an account, for Chicago trade, beginning January 1st. Manufacturers Agency basis. Address SALESMAN, care AMERICAN TELEPHONE JOURNAL, Monadnock Building, Chicago.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISSELL CO., Toledo, Ohio.

POSITION as wire chief in central energy exchange of from one to two thousand subscribers; 9 years' experience; best of references. A. B., care AMERICAN TELEPHONE JOURNAL, New York.

A HOME IN SOUTHERN CALIFORNIA—I desire to communicate with a man capable of taking charge of a factory for insulating rubber-covered National Code wires. This is a splendid opportunity for the right man. References given and required. No money necessary. Address P. O. BOX 1116, Los Angeles, Cal.

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TELEPHONE CIRCUITS—Article I

By H. P. CLAUSEN

IN this series of articles on telephone circuits it is intended to collect data which will be of value to those engaged in practical telephone work, and all diagrams showing obsolete systems will be rejected.

If, during the course of the articles, circuit combinations are

Fig. 1 being a purely diagrammatic representation of the well-known microphone movement, a description of which might be: "A carbon diaphragm lying in loose contact with a carbon ball." This diagram is especially applicable where the distinct feature of variable contact must be clearly shown. Where more elabo-



FIG. 1.

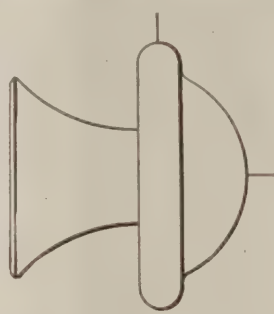


FIG. 2.

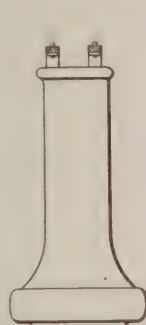


FIG. 7.



FIG. 8.



FIG. 9.

presented that do not embody every feature of practicability, criticism from any reader will be thankfully received.

During the past few years considerable improvement has been made in the direction of following standard forms of diagrams,

ration is desirable, a diagram showing the generally accepted form of transmitter (Fig. 2) may be adopted, presenting the "solid back" construction. Where the draughtsman is required to display an attractive drawing, and indicate an instrument

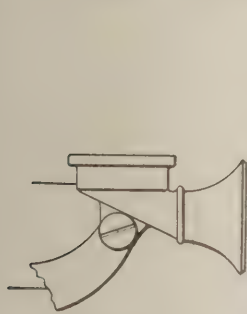


FIG. 3.

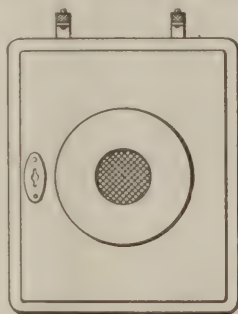


FIG. 4.

showing certain parts of telephone equipments with more or less accuracy, particularly diagrammatic representations of transmitters, receivers, plugs, spring jacks, switching keys, etc.

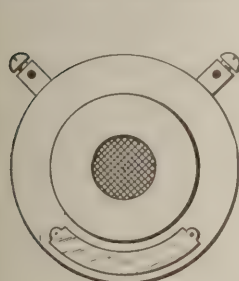


FIG. 5.



FIG. 6.

Every draughtsman will, however find occasion to use specially constructed diagrams to fit into certain parts of his drawing, as it often becomes necessary to show particular characteristics of the general design more prominently than others. In this series, however, sufficient standard diagrams will be supplied to fill all probable requirements.

TRANSMITTERS.

Four styles of transmitter drawings are given to select from,

EDITOR'S NOTE.—This is the first of a series of articles on this subject by Mr. Clausen. They will continue for over a year.

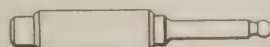


FIG. 10.



FIG. 11.



FIG. 12.



FIG. 13.



FIG. 14.



FIG. 15.



FIG. 16.



FIG. 17.

complete, Fig. 3 may be adopted,* this diagram showing the old style "Bell." It is sometimes necessary to represent an instrument as shown by Fig. 4, this diagram possessing the advan-



FIG. 18.

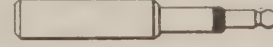


FIG. 19.

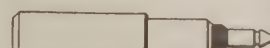


FIG. 20.



FIG. 21.

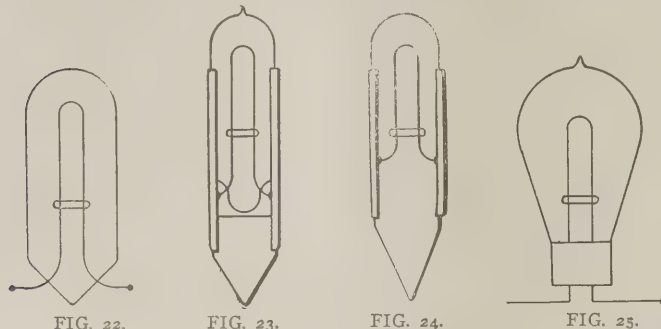
tage of presenting an attractive appearance without demanding much skill from the draughtsman. Fig. 5 is an instrument which may be suspended from a supporting arm, and its use is particularly applicable to the face views of switchboards. Fig. 6 fills the need for a combined transmitter and support.

RECEIVERS.

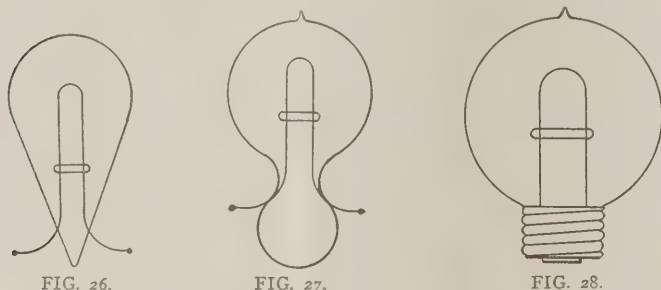
Standard forms of telephone receivers are so universal that more than three styles are unnecessary, Fig. 7 showing the accepted form of the regular subscriber's hand telephone and Fig. 8 the switchboard operator's head telephone with supporting band, while Fig. 9 shows the purely electrical diagram of a receiver.

PLUGS.

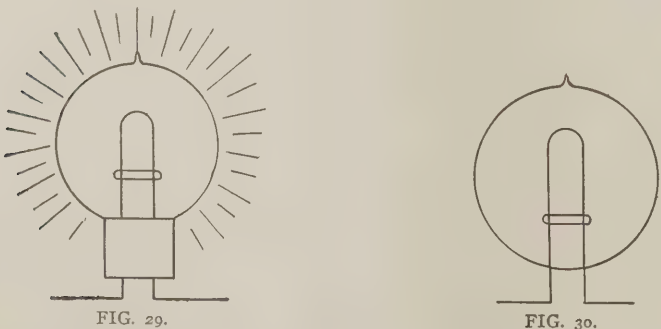
So many varieties of plugs are in use that it is necessary to provide a number of diagrams from which to select, thus, Fig.



10 shows a single contact or one-way plug, with the protecting sleeve extending clear to the base of the plug, while Fig. 11 shows a one-way plug in which the protecting sleeve does not quite reach the base, leaving the metal portion projecting. Fig. 12 represents a two-way plug with the sleeve construction similar to Fig. 10. Obviously the plug of Fig. 12 may be drawn to present the same general appearance as Fig. 11, with the only difference of the insulated portion between the tip and sleeve. Here

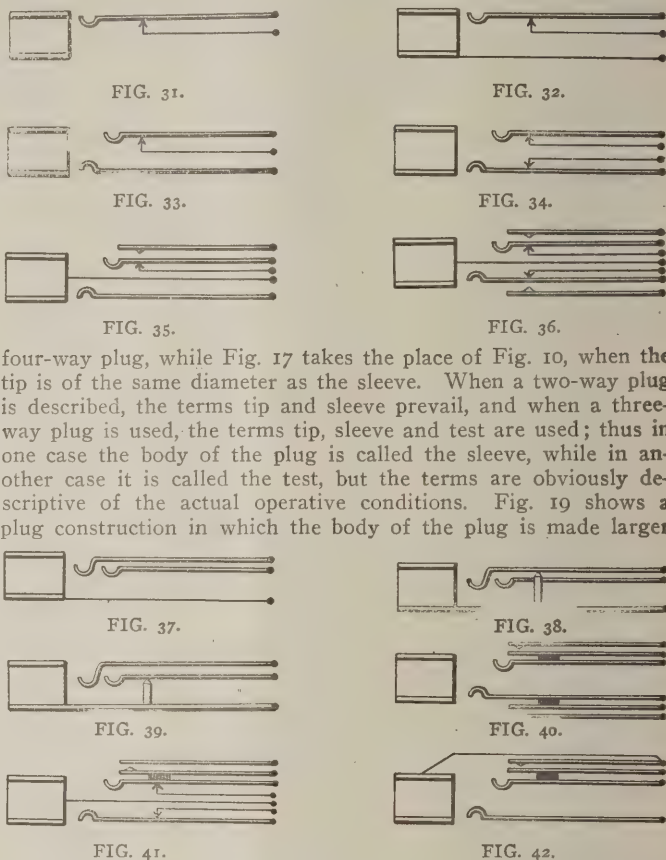


it is desirable to define the terms applied to plug contacts. Fig. 13 is a purely diagrammatic representation of a three-way plug. Describing the contacts, reading from right to left, we say: Tip, sleeve and shank, or otherwise the terms tip, ring and test may be applied, or, more properly and more generally, tip, sleeve and test. The latter appears to be the most acceptable appellation for first there is the tip, easily remembered, then the sleeve connection, which in commercial plugs always connects to the sleeve spring of the jack. The term "test" appears to be proper, for in



the old self-restoring drop boards the body of the plug, or the shank, which controls the operation of the restoring coil, and in the later common battery systems the body of the plug is that portion which controls the cut-off relay. In both cases the presence of a connection between the body of the plug and the test ring of the jack produces the condition of "busy." In other words, when the plug is placed into the jack, the line tests "busy" and therefore the term test for the body of the plug. The diagram in Fig. 13 is a handy one and easily understood when appearing in circuit drawings, for the connections are plainly read, being brought directly to the contact portions of the plug. Fig.

14 may be made to serve as a three-way plug. Usually some requirements have to be made as to circuit combinations produced while the plug is being inserted into a spring jack; for in most systems it may be objectionable to short-circuit the tip and sleeve springs of the jack during insertion. Then it is necessary to produce a form of plug shown in Fig. 15, in which the tip and sleeve are separated by a rubber bushing or an insulated metal ring, as in Fig. 18. Fig. 16 shows the appearance of a

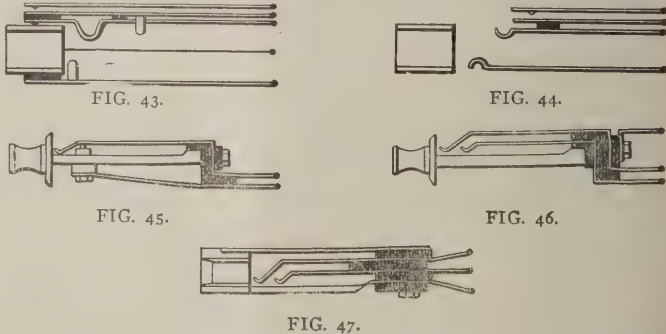


four-way plug, while Fig. 17 takes the place of Fig. 10, when the tip is of the same diameter as the sleeve. When a two-way plug is described, the terms tip and sleeve prevail, and when a three-way plug is used, the terms tip, sleeve and test are used; thus in one case the body of the plug is called the sleeve, while in another case it is called the test, but the terms are obviously descriptive of the actual operative conditions. Fig. 19 shows a plug construction in which the body of the plug is made larger

than the tip portion. Fig. 20 shows an accepted diagrammatic form of an operator's receiver connecting plug, made especially strong and usually of the two-way type, while Fig. 21 shows the form of three-way plug used for the same purpose.

INCANDESCENT LAMPS.

There are enough lamp diagrams shown to give a sufficient variety for all purposes, Figs. 22, 23 and 24 showing the generally accepted forms for diagrams of switchboard circuits, while Fig. 25 shows a more elaborate construction. The diagram of Fig. 26 is the simplest and easiest drawn. Fig. 27 has been used considerably in patent drawings, and it is presented for that



reason. Fig. 28 is another form, while Fig. 29 represents a burning lamp. Fig. 30 is easily drawn, but in general Nos. 22, 25 and 26 meet all necessary requirements.

SPRING JACKS.

Diagrams of spring jacks require a considerable variety, as the combinations are numerous. Fig. 31 shows the simple one-way jack, with a normally closed back contact. Fig. 32 shows a two-way jack, with tip spring provided with a back contact. Fig. 33 shows a two-way jack having tip spring provided with a back contact and in addition a sleeve spring. Fig. 34 shows a

two-way jack and having both tip and sleeve springs, each provided with a back contact. Fig. 35 represents a three-way jack with the tip spring provided with a normally closed back contact and arranged for closing when operated, a normally open-front contact. Fig. 36 represents a three-way jack, with both

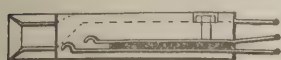


FIG. 48.

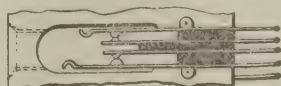


FIG. 49.

tip and sleeve springs provided with back contacts and normally open-front contacts, which are closed when plug is inserted into the jack. Fig. 37 represents a three-way jack of an accepted standard construction. It is usual to show the tip and sleeve springs on the upper portion of the jack so as to obtain all possible advantage from the downward strain on the base of the plug, which would naturally lift the front of the plug into closer contact with the connecting springs. Fig. 38 shows Fig. 37 combination with the sleeve spring provided with a back contact. Fig. 39 shows the same combination as Fig. 37, with the tip spring provided with a back contact. Fig. 40 is a more complicated construction. In this combination the insertion of a plug results in both the tip and sleeve springs forcing into contact two sets of normally open contact springs. While this jack is known as a two-way type, it really contains six springs, while resting all springs being clear from each other. Fig. 41 is a three-way jack, with the tip and sleeve springs each provided with a back contact and the tip spring provided with a set of two auxiliary springs which are closed when the plug is inserted. Fig. 42 is a two-way jack, in which the tip spring is provided

with a set of two auxiliary springs, one of which is connected to the test ferrule of the jack; thus when a plug is placed into the jack the two auxiliary springs are connected together and produce a "busy" condition on the test ring of the jack, even though the body of the plug may not be connected to the circuit. Fig. 43 represents a peculiar combination to which spring jacks are susceptible; the tip spring of the jack rests on the sleeve ferrule, and is insulated from another spring, connected to a pin projecting downward through it. There is an auxiliary spring outside of this spring and on the opposite side of the jack a third auxiliary spring resting upon but insulated from the sleeve ferrule, this spring being provided with a projecting pin, as shown. When a plug is placed into the jack, the tip spring is lifted out of contact with the sleeve ferrule, and when the plug, which is similar to Fig. 19, is pressed far into the jack, the tip spring is forced out by the larger body of the plug and makes contact between the two outside auxiliary springs, while at the same time the single auxiliary spring mounted on the opposite side of the sleeve ferrule connects itself with the metallic portion of the sleeve of the plug.

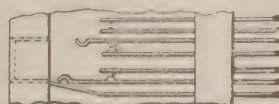


FIG. 50.



FIG. 51.

Fig. 44 shows a combination similar to that of Fig. 42, with the difference that the test ferrule is not connected. Figs. 45, 46, 47, 48, 49 and 50 are provided for the purpose of giving latitude for selection. Fig. 51 is arranged for use in connection with the plug shown in Fig. 21.

COMMON BATTERY SWITCHBOARD SPECIFICATIONS II.

By CHAS. L. GOODRUM

IN a previous article nearly every part of the installation and materials of a common battery switchboard was specified.

There are, however, a few details not yet mentioned that will now be taken up. The specifications which have been given in these articles were prepared for the installation of a 1,440-line switchboard for the Norristown, Pa., exchange of the United Telephone and Telegraph Company, of Philadelphia, Pa.

Storage Battery—A storage battery of necessary number of cells and ample capacity for properly and satisfactorily operating the exchange with its maximum number of subscribers, without injury, shall be provided for. The capacity of the battery to be sufficient to operate the exchange with ultimate capacity of board, on a full charge for 36 hours. The lugs of the several cells shall be burned together and to the bus bars in a thorough workmanlike manner. In case of battery being used while charging, provisions for keeping all lines free from the hum of the charging machines must be made. All bus bars, leads or wires used in any part of the work must be of ample carrying capacity and of sufficient size to insure freedom from cross-talk.

Numbering and Lettering—The multiple jacks shall be numbered in groups of 100 by a figure neatly painted on the strip to the left of the jacks. The answering jacks shall be numbered from 0 up in the manner already indicated under the spring jacks.

The position numbers shall be placed below the transmitter are in figures 0 high and shall run from 0 to 5. All leads or wires used in common in the switchboard shall, where terminated on clips or terminals be designated by appropriate lettering. The terminals on the distributing boards, all relays, impedance or repeating coils, and the power and fuse boards shall be appropriately numbered or lettered in a manner satisfactory to the engineer of the telephone company.

Testing Telephones—After completion, the entire installation shall be tested to demonstrate that all apparatus and wiring are in good working condition. In the event of the terms of the test not being specified, ample margin shall be allowed to cover all contingencies.

Blue Prints, Etc.—The contractor shall submit with his bid, blue prints and samples showing the apparatus and circuits he

proposes to use and the designs of the various desks, switchboards and fuse boards.

General Conditions—All materials, labor and tools necessary to properly complete the equipment and installation of this exchange whether specifically mentioned or not, shall be furnished and installed by the contractor, to completely equip a first class, high grade common battery exchange which shall give service equal to the best in use. After completion of the work, the contractor shall remove all debris, disposing of it in a manner suitable to the telephone company and the city authorities. The work shall not be deemed completed until the work called for by these specifications is ready for immediate and continued service, all material and workmanship having been duly approved by the engineer of the telephone company.

The contractor shall submit a separate figure giving the price for which he will furnish 300 wall telephones and 100 portable desk telephones complete in every particular and arranged to work in connection with above apparatus.

The telephones shall be arranged that the calling and disconnecting signals are given by removing and replacing the telephone on the hook and all current used in connection with the telephone shall be furnished from the Central Office. All exposed portions of the instrument shall be heavily nickel plated and all contacts platinum pointed.

Each subscriber's telephone set shall consist of one granular carbon transmitter, one bi-polar receiver with green silk covered cord, a reliable type of automatic switch-hook with all contacts platinum points, riveted, one polarized bell wound to 1,000 ohms, one condenser, one induction or impedance coil and the necessary terminals, cords, bindings, posts, screws, wiring and other apparatus to make the telephone complete and satisfactory in its operation. The cords furnished with the desk sets shall be not less than 8' 6" in length and furnished with tip or terminals on the ends. Hard rubber receiver shells and transmitter mouth pieces shall be furnished. All soldering shall be done with resin flux and the wiring shall be of a neat and workmanlike manner. No exposed metal shall be part of the circuit.

The design of the wall and desk telephones shall be subject for the approval of the telephone company.

The telephone company desires to emphasize the fact that in the matter of speech transmission, the telephone must be equal to the best in use. Sample must be submitted.

Extra Work—No claims for extra work will be allowed, unless the work shall have been performed by the authority of a written order from the general superintendent of the telephone company. The telephone company may make any reasonable alterations in the plan or extent of the work during construction. If such alterations diminish or increase the quantity of work to be done, an amount shall be deducted from, or added to the amount to be paid, according to the quantity actually done, at the price established for such work by contract.

Material and Inspection—All materials and apparatus used in this work shall be first class of their kind, subject to the inspection of the engineer of the telephone company. All work shall be done to the satisfaction of the company and be subject to the inspection of its engineer as the work progresses, but such inspection is not to relieve the contractor of any obligations to deliver sound and reliable work.

The contractor guarantees all apparatus to be free from defects, and should any part or parts prove defective within a period of one year from date of installation, he will repair or replace same without charge, upon the material being returned to his factory. The contractor shall furnish all facilities for making any tests, and shall permit access of the company's engineer or agents to the work or any part thereof wherever located.

The engineer of the telephone company, or his authorized representative, shall have the right to reject any material or workmanship which may be deemed, after careful inspection, not fit for acceptance or in full compliance with these specifications. The telephone company shall have the right to suspend work or annul the contract upon continuance of the contractor to use faulty material or workmanship but such annulment or cancellation shall not prevent the company from collecting damages caused thereby.

Risk—Any damage or loss accruing to any of the property necessary for, or used in, the installation of the plant, whether caused by the fault or carelessness of the contractor or his employees, by theft, fire, water or any other way, before the entire work is formally accepted by the telephone company, shall be made good at his expense and in a manner satisfactory to the engineer of the telephone company.

Time of Completion—Time shall be the essence of any contract basis upon these specifications. The contractor shall agree to have the work ready to turn over to the telephone company, completed in every detail and ready for immediate and continued service (name date). He shall understand and agree that for each and every day beyond the stipulated time, until the plant is completed and accepted by the engineer of the telephone company, a penalty of _____ shall be paid as indemnity to the telephone company for losses incurred through or due to such delay.

Disputes—All disputes arising out of the nature of the work whether as to materials, workmanship or the like, shall be settled by the engineer of the telephone company.

Infringement of Patents—The contractor shall give satisfactory guarantee against loss from any suit or claims for infringement of patents and shall defend the telephone company at his own expense against all such suits and claims. Such guarantee to remain in existence for all times, and in case of any loss to said company that may be occasioned by such claims or suit, either in form of an indemnity or loss of time through injunctions of the court, the contractor shall fully indemnify the company from such loss.

Future Equipment—The contractor working under these specifications agrees to furnish and install all additional equipment as it may be required from time to time under the schedule submitted herewith, or at the prices charged his most favored customer, as the telephone company may elect.

Wire, Etc.—These specifications include the furnishing of proper installation and connection of all wires, cables, etc., from the outgoing cable terminal heads throughout the exchange necessary for the satisfactory and continued operation of the exchange, and to the satisfaction of the engineer of the telephone company. The contractor shall further supply all material and labor necessary for furnishing and placing all cable runs, boxes, etc. All wiring shall be done so there will be no change in it when the ultimate capacity of the switchboard is installed, other than to increase the number of wires, cables and apparatus to that actually required in the operation of the added capacity.

Terms—Wherever the term "Company" or "Telephone Company" appears in these specifications, it signifies the United

Telephone and Telegraph Company, of Philadelphia, Pa. Wherever the term "Engineer" appears, it signifies the Engineer of the United Telephone and Telegraph Company. Wherever the term "Contractor" occurs, it signifies the bidder who has been awarded the contract to do the work set forth in these specifications.

These specifications must be returned with the contractor's proposal.

The system shall be tested by actual service for 60 days after the contractor has entirely finished his contract, and the exchange is opened for service.

Time—All bids shall be submitted in sealed proposals indicating thoroughly what bidder proposes to use, and shall be in the hands of the Telephone Company on or before _____ day of _____.

The company reserves the right to reject any or all bids submitted.

ENDORSEMENTS FROM OPERATORS.

VINTON AND BENTON COUNTY TELEPHONE CO.

VINTON, IOWA.

Editor, The American Telephone Journal.

Sir:—As a national magazine your paper is pre-eminently the best, and I, for one, should like to see it in the hands of every telephone man in the United States.

S. S. LICHTY, General Manager.

CENTRAL CONSTRUCTION CO.,

TOLEDO, OHIO.

Editor, The American Telephone Journal.

Sir:—Your paper is the only telephone paper that I read, and the only one to which all of the companies in which I am interested subscribe.

JAMES S. BRAILEY, JR., General Manager.

THE DUNKIRK HOME TELEPHONE COMPANY,

DUNKIRK, N. Y.

Editor, The American Telephone Journal.

Sir:—I know a number of telephone men, and have already told them that your journal was the only good, practical telephone journal published.

B. F. REUTHER, General Manager.

THE KANSAS TELEPHONE ASSOCIATION.

MARION, KANSAS.

Editor, The American Telephone Journal.

Sir:—Here's your dollar. You are getting out a paper which contains much interesting matter for the progressive telephone man.

CHAS. E. WELLS, Secretary.

THE VALLEY TELEPHONE COMPANY,

SAGINAW, MICH.

Editor, The American Telephone Journal.

Sir:—Your publication is so far and away ahead of the other telephone journals (some of them distinctly telephonic and some of them generally electrical) that I don't feel as though we could spare from our files a single issue of your paper.

R. F. JOHNSON, General Manager.

ALDEN TELEPHONE CO.,

ALDEN, N. Y.

Editor, The American Telephone Journal.

Sir:—I take other journals, but yours is in the lead.

F. W. SWIFT, Manager.

INDEPENDENT TELEPHONE COMPANY,

SEATTLE, WASH.

Editor, The American Telephone Journal.

Sir:—Our Mr. Pazak has highly recommended your paper to me as the only up-to-date telephone journal published.

A. B. CURRIER.

BEAUMONT TELEPHONE COMPANY,

BEAUMONT, TEXAS.

Editor, The American Telephone Journal.

Sir:—I like your journal very much, and do not want to miss any of the numbers.

W. C. BENSCHOLM.

FOREIGN CURRENTS.

IN the unending discussion that rages about the question of municipal telephony in England, much unfavorable comment is made on the extremely low estimates prepared for the construction and operation of municipal telephone systems. Not merely the opponents among the ratepayers to the municipal telephone schemes in the various towns, but various responsible telephone experts and consulting engineers have pointed out that the municipalities and their advisers are attempting both to build and to operate too cheaply. In prices of materials and rates of wages and salaries there is considerable variation, as between England and the United States, but the variation is not so great as to justify some of the amazingly low figures that seem to be a necessary accompaniment of English municipal telephone enterprises. For example, in the latest copy to hand of *The Electrical Times* there appears an announcement inviting applications for the post of manager of the municipal telephone system of Swansea. The notice states that applicants "must possess good experience of telephone management, accounts, storekeeping and engineering," and the salary offered works out at *something less than fifteen dollars a week*.

* * *

Now, living may be very cheap in England, and excessively cheap in Swansea, a seaport town of about 95,000 inhabitants, but what sort of a telephone manager can possibly be content to live on a trifle over two dollars a day, even in Swansea? The qualifications required for the post are fairly clearly stated, as the applicant must possess good experience of telephone management, accounts, storekeeping and engineering. Now for a man to have acquired "good experience" of telephone management, accounts, storekeeping and engineering he must have spent some years in the telephone business, have worked in the various departments specified, and then have had at least a year or two of responsible control over all departments. Consequently a man who would answer to these requirements might reasonably be expected to be a man well over thirty years of age. A man well over thirty years of age is not infrequently a married man, especially a telephone man, who needs as consolation for the trials and tribulations of the day a more than usual allowance of the sweets and joys of domestic life in his off-time. As a married man he would not be departing widely from the accepted practice of married life if he were the father of one or two children. Therefore the Corporation of Swansea is asking for the services of a man who must have had from ten to fifteen years practical experience of telephony to fit him for the designated position, and who quite reasonably may have a family to support, in exchange for the pitiful remuneration of less than fifteen dollars a week!

* * *

If fifteen dollars a week is the measure of the salary of the responsible head of an English municipal telephone system, on which the capital expenditure is some \$100,000 to \$125,000, one naturally wonders what sort of wages the linemen, inspectors and operators are expected to work for. No figures on this point are available, as in these departments of the work the ruling rates of wages must naturally be paid, and as the supply is presumably equal to the demand, advertisements for applicants are not made. Judging from other advertisements we see in the English electrical papers, however, for jointers, meter-testers, inspectors and so forth, we gather that electrical work-people in England earn wages that average about half the rates that obtain in this country. The particular point in interest at present is the unhappy telephone manager, who is required to look after the general management of the entire system, presumably of at least two thousand lines, to be responsible for the accounts and for the stores, and to exercise supervision over the engineering of a complicated electrical and mechanical plant, all for the princely salary of fifteen dollars a week.

* * *

The conditions under which the telephone business is run differ widely, of course, in different countries, and even differ considerably as between different telephone enterprises in the same country. But, broadly speaking, the qualifications of a telephone manager are much the same everywhere. That is, to put the matter more specifically, the qualifications desirable in the ideal telephone

manager—who is an extremely rare specimen—are the same everywhere, or should be the same if those in control of the telephone business have the right idea of the present and future possibilities of the telephone. Unfortunately, however, for the general progress of the telephone those in supreme control of the business, with very few exceptions, have not come within a measurable distance of appreciating to the full the present and future possibilities of the telephone. Were it otherwise we should not see the operation of telephone systems confided to parish councils, which in turn entrust the management of the telephone system of a town of nearly 100,000 inhabitants to a man who is content with a salary of seven hundred and fifty dollars a year.

* * *

What are the real qualifications of a telephone manager? Are they simply the possession of a few years' experience of supervising a small exchange system, the ability to keep correct accounts, to scrutinize the receipt and expenditure of materials, and to supervise in a general way the laying of cables, the erection of poles, the stringing of wires and the installation of exchange equipment? Or is something broader required? Even the knowledge and experience necessary to overlook efficiently the work referred to and to handle properly the staff occupied in its various branches would be none too highly paid at fifteen dollars a week, or, allowing that money is worth half as much in the United States as in England, in this country at thirty dollars a week. A telephone man with the ability and experience sufficient to supervise and maintain the even and economical working of an exchange system of two thousand lines, even if he had no other qualifications, would be selling his services remarkably cheap for thirty dollars a week. In fact, it is hardly a paradox to say that the man who would take such a position at such a salary in this country would not be worth thirty dollars a week. It would probably be cheaper in the end to pay him that much to stay away.

* * *

Looking at the matter from the point of view of the broadest and most scientific development of the telephone, which is the ideal of the modern telephone man, it is evident that the qualifications required of a telephone manager are much broader and more varied than those which would suffice for the administration and supervision of a system of a couple of thousand stations that was expected merely to jog along at an even pace, giving a reasonably satisfactory service at the lowest possible expenditure for labor and materials. The modern telephone man aims at the highest possible development of the telephone service, both in respect to the number of users of the service and in respect to the usefulness of the service. The old ideas that in a town of a given size a telephone system of a certain size was required have been thoroughly brushed away. Not long ago it was generally considered that a telephone system of 5,000 lines was a very large system indeed, and that towns of say 100,000 inhabitants were doing well in the telephone line if they could boast of a couple of thousand telephone subscribers. Evidently there are still those that gauge the telephone capacity of large towns according to these antiquated figures. But to the telephone man of modern ideas there is practically no limit to the future development of well-equipped and well-managed telephone systems. It has already been shown that a telephone development of ten per cent. of the population may easily be attained in a commercial center, and it is quite probable that this figure will be surpassed in the future.

* * *

A development of ten per cent. means 10,000 telephones in a city of 100,000 inhabitants. So valuable and important a method of communication has the telephone service grown to be that any telephone management which plans for a future, one might almost say an immediate development inferior to this, is doing its duty neither to the inhabitants nor to the telephone. The ability to manage a telephone system conceived on this scale, to secure such a development, to provide the required grade of service, to organize and supervise the staff needed, and to cope effectively with all the multifarious questions, technical and administrative,

that arise in the conduct of a rapidly-growing telephone system is of quite a different order from that which may give fair satisfaction in charge of a stationary system of small size. Which all goes to show that the fundamental questions of the telephone business are but dimly appreciated in England. A telephone system that does not grow and is not intended to grow has no place

on this earth; it does not fairly represent the telephone nor fairly serve its customers. None but a small stationary system, intended to remain a small stationary system, can be managed by a man worth only fifteen dollars a week. Therefore, the persons who make such an offer have no appreciation of the possibilities of the telephone.

The Arrester.

TELEPHONE EXCHANGE ENGINEERING

ARTICLE I.

By RAY H. MANSON, ALBION D. T. LIBBY and CHARLES A. SIMPSON

THE subject of telephone exchange equipment using the latest engineering designs, and best American practice has been touched upon by various writers, but the articles have been somewhat disconnected and the many points of construction have not been put in such a form, as to be entirely clear to the reader. So there is very little literature on the modern common battery exchange, which gives a complete idea of what steps must be taken, and what points be considered before a purchaser is able to select the best equipment.

To more completely cover the ground, it is proposed to take up the design and construction of a telephone exchange of a predetermined size, and follow the course of construction from the selection of the system to its installation and operation. It is intended to give a complete set of specifications, which a purchaser can submit to manufacturers for bids. These specifications will be full and in detail, and will contain everything that is necessary for a contract, so that those who may have occasion to use them can rest assured of an agreement, which is binding and fair to both parties. Subsequently circuits will be given with descriptions for working; then the detailed design and shop construction of apparatus. After this, complete installing directions, followed by chief operator's desk equipment, wire chief's desk and toll board.

In the construction of an exchange the first thing to do after the company has been formed, the franchise procured, and the funds raised, is to decide on a desirable system. This may seem an easy matter, but it should receive the most careful consideration from all points of view. It is not in the power of a telephone company to change its entire system within five years after installing, and pay interest on the investment. So the latest system suited to the requirements of the town, must be selected and installed with a view to the future.

As to whether the system is to be manual or automatic, multiple or transfer (trunking), common battery or magneto, should be decided before asking manufacturers for bids.

The multiple switchboard is a system, wherein all of the lines that enter the exchange are duplicated or multiplied at frequent enough intervals to enable each operator to have within reach a terminal for all lines. Thus each operator is able to answer any call without the aid of any other operator. The disconnect signals for any connection are also under the vision of one operator, and the chief cause for "tie ups" removed.

There is a general opinion among those unacquainted with the arrangement of apparatus and wiring of the multiple system, that it is not only the most expensive to install, but that it is the most complicated and difficult to keep in working order. This idea originates in the impression that there are many duplications. A simple circuit installed in a multiple board, presents a complicated appearance, but in reality it is an easy matter to trace the conductors and apparatus forming each individual line owing to the systematic arrangement and numbering of the parts, as well as the color code of the wires forming the conductors. Suffice it to say that where quick reliable service is required the multiple switchboard presents the highest type of exchange equipment.

The transfer or trunking systems require more than one operator to handle connections between two subscribers, and even with perfect supervisory systems, complicated in themselves, the attention of two operators is required on each connection, thus slowing down the service, and increasing the liability of error. Only one terminal for each line is required, and this is the only

advantage to be offered for such a system. The saving in the cost of the transfer over the multiple system, when considered in its proper light, will not usually cause the exchange owner to decide in its favor.

The question as to magneto or common battery is one that is easily settled. The magneto subscribers' instrument requires a complete signal current generating machine, as well as a source of battery power for talking. The advantage of eliminating many parts, and substituting one central source, or common battery to signal and supply current for talking, requires no further argument.

The central battery system provides for the automatic signaling of the exchange, double supervision over the operators and automatic "clearing out." This arrangement, together with the multiple jack system, renders the quickest and best possible service obtainable.

It has been the aim of telephone engineers to take away from the subscriber as much work as possible, or to transfer his equipment to the central office, for the less work the subscriber has to do the better satisfied he is.

Where line construction is poor and automatic signalling is required, it is sometimes attempted to use local battery for talking. Any flexible common battery system will admit of placing local battery instruments on the lines, provided they are supplied with a condenser in series with the bell. The bell should have a resistance of five hundred ohms or more, and the condenser two microfarads capacity. Such local battery instruments do not require a magneto for calling and so far as the subscriber is concerned they present all of the advantages of common battery and permit of better transmission over a poor line.

A great disadvantage of the local battery is the trouble experienced by the falling of the battery voltage during conversation, so that for long distance or even ordinary conversation, transmission becomes weak.

Questions regarding system, as well as the specifications for the telephone exchange should be settled, by the engineer of the telephone company, provided a competent man is available. Failing in this, manufacturers specifications should be followed. Accurate floor plans of the exchange building, the present and ultimate number of subscribers' lines, the source of primary power should be in evidence for the consideration of manufacturing concerns when asking for estimates, specifications and bids. The engineering staffs of such companies, know best how to arrange their respective apparatus and equipment, so as to economize space and give the most efficient operation, and it is advantageous to seek all possible advice from the manufacturer.

In considering bids for exchange equipment the points to be reviewed are, in order of their importance, circuits, apparatus, operation, maintenance and original cost.

Apparatus should be of efficient design, substantial, and constructed of the best material.

Circuits should contain enough apparatus to be perfectly balanced under all operating conditions, and arranged to produce no cross-talk, or other inductive disturbances. The battery or power consumption should also be carefully considered in connection with the circuits.

In operation the points to be considered are efficiency of operation from the subscriber's station, as well as the exchange end.

While the cost has considerable to do with determining what system will be adopted, and to whom the contract will be awarded, it should not influence the purchaser into buying apparatus, which will be expensive to maintain and difficult to operate.

IN THE OPERATING FIELD

INSPECTING FEDERAL TELEPHONE

PRESIDENT F. S. DICKSON, of the Federal Telephone Company; Secretary James B. Hoge, Manager Maxime Reber and Auditor Leon O. Fisher are on a second and concluding trip of inspection of the properties of the Federal Telephone Company, which, owing to lack of time, the party was unable to inspect on its first trip. The main result of the inspection of the properties has been to convince Mr. Dickson of the necessity of obtaining for other companies beside the Cuyahoga an advance in rates in order that the largely increasing business may properly be taken care of. There is no lack of new business, but as every new telephone put in increases the cost of operation out of all proportion to the rates now being received, it has become imperative for something to be done in this connection. Of the general condition of the various plants inspected, Mr. Dickson expresses his complete satisfaction, and there is no intention on the part of the Federal Telephone Company to part with any of the properties or in any way to let up on its scheme of perfecting its service and carrying on a vigorous campaign against the Bell interests. The company now owns sixteen properties in addition to having a large interest in the exchanges at Akron, Columbus and Portsmouth. The properties owned outright are as follows: The Cuyahoga and United States, of Cleveland, Bowling Green, Columbiana, Detroit, Findlay, Fostoria, Lancaster, Lima, Logan, Mansfield, Massillon, Stark County, Toronto, Youngstown and Zanesville.

NORTHEASTERN COMPANY REORGANIZED

THE NORTHEASTERN TELEPHONE COMPANY has been reorganized and new life put into it. At a meeting of the board of directors, held in Portland, Me., recently, a new board of officers was elected and steps looking toward an immediate beginning of extensive operations were taken.

L. A. Goudy resigned as president, and in his place the board elected Thomas R. Brooks, of Scranton, Pa. Mr. Goudy was elected vice-president in place of Melville H. Kelly, of Saco.

Elford L. Durgin, of Portland, recently of Farmington, resigned as treasurer, and the vacancy was filled by the election of Edwin L. Gearhart, of Scranton. Mr. Durgin was made assistant treasurer, to succeed Edwin A. Merritt.

E. I. Durgin, John J. Frye and William G. Nash, of Portland, resigned as directors, and in their places Edwin W. Gearhart, Thomas R. Brooks and R. G. Brooks, of Scranton, were elected.

No details further than this can be had as yet, but it is understood that Scranton capitalists have invested largely in the stock of the company and will have a guiding hand in the management of the company's affairs; that the capital stock has been increased and that the installation of an extensive plant in Portland will be immediately begun.

WHO'S ELECTED BY TELEPHONE

PEOPLE in Pittsburg, Pa., just now are indulging in much favorable comment on the election returns achievements of their Independent telephone company, the Pittsburg and Allegheny Company. The following telling endorsement of its service is quoted from *Money*, the financial paper of Pittsburg:

Many things are expected of a telephone company nowadays by its patrons, which were not thought of two or three years ago—and before the advent of the Independent telephone company in this city, which has shown its enterprise by adding from time to time some new and desirable features of service for its subscribers.

This company deserves credit by the way in which it handled the election returns and flashed the intelligence that it gathered from all over the county upon its large canvas stretched across Smithfield street, and for the way in which it distributed these returns to its patrons at their residences. All of the chief operators at the various exchanges in the city and throughout the county, were connected on a wire which was common to all, and when the news was flashed over the line to them from political headquarters, they all received it at the same instant. In the

same way, all of the company's patrons who had expressed a desire to be furnished with the returns, had been previously connected on a common wire, grouped in exchanges, and the chief operator in each exchange repeated the news at once into her transmitter and it was received simultaneously by all these subscribers. In this way the company's patrons in Sewickley received the news as promptly as those in New Kensington or Carnegie, and in fact in all of their other exchanges, some twenty in number.

The out-of-town news was handled in exactly the same way, and it was generally remarked on the street that the news flashed by the P. & A. Company upon its canvas was fully twenty minutes ahead of the newspaper bulletins.

A telephone company, with thousands of wires reaching out into all sections, has an immense advantage over the telegraph companies in handling news of this sort. The latter companies may have stations at all points, but these stations are connected on one loop of wire over which only four messages can be sent at the same time, while with the telephone company the returns were received from all points simultaneously and without the slightest delay.

TOLL LINE COMPETITION

THE BELL TELEPHONE COMPANY is to have further competition in Joplin, Mo., in the way of toll lines. At present the only connection that Joplin has with Springfield and points east of Carthage is over the Bell line.

However, a company is now in the field preparing to extend an Independent system to both Joplin and Springfield. The promoters of this enterprise are the owners of the Southwest Missouri Telephone Company, with headquarters in Monett, and the Home Telephone Company, of Springfield. A. Peele, president and general manager of the Southwest Missouri Telephone Company, says it is to be a complete copper metallic system, the best that is known, and will cost about \$200 a mile, or \$2,000 for the line between Springfield and Joplin.

The promoters are backed with unlimited capital, and men of experience in the telephone construction business.

Mr. Peele stated that the main obstacle hindering the immediate construction of this first line is the difficulty in securing suitable poles. He says that good poles are in demand, and it is a difficult matter to get them when wanted.

CENTRAL UNION OUSTED

AFTER a rather warm and spirited debate, the city council of Rock Island, Ill., has passed an ordinance repealing the franchise of the Central Union Telephone Company. This company has had a perpetual franchise in Rock Island for a long time, giving it an absolute monopoly. It imposed rates and conditions on the long-suffering public there, and yet it seemed there was no redress for them. But the Bell Company carried its high-handed practices too far. At last the worm turned. The council granted a franchise to the Union Electric Telephone and Telegraph Company, an Independent concern, which has made good use of the franchise granted, and is now rushing a fine new system to completion.

The people welcomed this new company, and as it progressed they became bolder in their dealings with the Bell Company. This sentiment culminated recently when the council by a vote of 10 to 4, enacted the ordinance repealing the franchise of the Bell Company. There is considerable likelihood, however, that the Bell Company will not calmly accept this ruling, and retreat bag and baggage, without a fight. A fight, and a long, hard one will be made in Rock Island, but there is not much doubt as to the final outcome. The new Independent company, with the sentiment and sympathy of the public and authorities of Rock Island back of it, has a distinct advantage over its opponent, which is handicapped by the record of its oppression before the advent of its Independent rival.

Opinion and Comment

THE TELEPHONE MANAGER

IN our department of Foreign Currents this week there occur some lively strictures on the advertisement of the English Corporation of Swansea for a manager of the corporation telephone system, who must be an experienced telephone man and is to receive a salary of seven hundred and fifty dollars a year. Standards differ all the world over, and evidently the English standard of a telephone manager differs widely from that which obtains in this country. Apparently in England the telephone business is expected practically to stand still. An American telephone company starting a system in a town of nearly 100,000 inhabitants would plan for a development of at least 10,000 telephones and would require a manager capable of securing such a development and of handling a system of that size.

This reflection naturally leads one to ask a question or two about the qualifications of the real telephone manager. The real telephone manager is he who succeeds in developing the system, in providing an efficient service and in conducting the whole enterprise in a sound and economical manner. To accomplish all this something more is wanted than mere experience. A man may have twenty years' experience of the manner in which telephone systems have been run in the past and still lack the essential qualities necessary for success in the future. He may be an expert engineer, a quick accountant, and even possess a positive genius for the economical control of stores, and yet lack the insight to discern that the business is taking a different turn and a bolder flight and be quite without the foresight which meets the problems of development half way and attacks them on a broad scale. His knowledge of telephones and telephone lines may be extensive and refined, yet he may be wholly without the saving quality of common sense, which is indispensable in dealing with that most difficult section of the public—the telephone subscribers.

The modern telephone manager needs above all to have common sense, to be able to deal in a broad-minded way with all the petty squabbles and arguments that arise with telephone users, grantors of rights-of-way, and others with whom a telephone company has business of a more or less delicate nature. Whether this business is dealt with in a liberal and pleasant manner or the reverse has a powerful influence on the popularity or unpopularity of the enterprise. Therefore a telephone manager without a liberal endowment of common sense is bound to be a failure. Next to common sense we place organizing ability, which ensures the collection of a good staff and consequently ensures the efficiency of the service and enterprise, which makes for the development of the business.

If a man be possessed of the rare gift of common sense, have good executive ability and plenty of energy and enterprise, he will soon make a good telephone manager, even if he never saw the inside of a telephone exchange or of a telephone ledger before taking charge of both. We by no means intend to decry the value of experience in saying this. Any telephone manager is naturally the better off for having had some experience of telephone management. But our point is that any amount of experience will never make a man a good telephone manager if he

lack common sense, foresight and enterprise; whereas, a man who is gifted with common sense, who is a born organizer, and who has the requisite enterprise to devise methods of developing the business, will make a successful telephone manager after a very short experience with the practical working of a telephone system.

TELEPHONE SPECIALISTS

TO be an adept in one branch of a certain industry, is the best credential or recommendation a young man seeking employment can have. Such young men are hard to find. There is a great demand for them, and when once employed, they command the best salaries, and their employers are loth to lose them.

There is no industry in the world that demands specialists more than electricity. In the telephone branch of the science, for instance, no one person can thoroughly cover each department. A man proficient in one branch of the business is required for that particular branch. One man may be a specialist in switchboard work; another in storage batteries and power generators; one in line work, and still another in underground cables and conduits, and so on—each man doing the work for which he is best adapted and prepared.

This does not mean that a young man adopting telephony as a career, should not learn and know all he can of every branch of the industry. That also is essential. What is meant, however, is that one particular branch of the work should be chosen, and studied and adhered to, and made a specialty. The young man should make it his aim to excel anyone else in the line of work he adopts. His services will always be in demand if he does this, and he will command the highest salary.

We are led to make these remarks at this time by the receipt of numbers of letters complaining of the difficulty of securing cable splicers. These letters come from the cable manufacturing companies and also from construction companies and operating companies. A good cable splicer commands good wages, with expense allowances, and railway fare to and from his work.

There are probably hundreds of young men in the telephone industry who have a slight knowledge of the splicer's duties, along with a little of everything else connected with the business. They can perform any duties that may be assigned them in a fairly satisfactory way. But they cannot do any one thing better than any of their fellows. They are not specialists. And they do not receive large salaries, nor are their services in great demand.

In order to make a success in life, they must adopt some particular work and become expert in it. They already have the essential general knowledge and training, but they are lacking in special fitness for one thing.

To such young men, a good opening presents itself in the suggestion given above. But there is a demand for other specialists besides splicers. That example is given simply because it has been brought to our attention recently. There are equally pressing demands for proficient men in other departments of the telephone business.

CONTEMPORARY CROSS TALK

LORD KELVIN is reported to have said once, sitting on a mountainside with a friend and suiting the action to the word, "I drop this grain of sand on the ground, and the whole earth feels the shock." A statement literally true, no doubt, but requiring the mind which demands measurements to the millionth of an inch to conceive it and to appreciate it. This little anecdote may seem to have little bearing on telephony, but it is a text that conveys a deep and important lesson to telephone managers. Clip a second off the average telephone connection and the whole system feels the shock, or rather, the effect. Every part of the plant and of the apparatus and operating staff is benefited and economized by a second, or even a fraction of a second, gained in operating the average connection. The time of operating the average connection is a measure which determines the capacity required of a large part of the plant and that second more or less affects the trunk line plant, the switchboard plant, the size of the exchange and consequently the size of the building and the real estate required to accommodate the exchange.

* * *

It does not require very deep or extensive investigation to prove this proposition. The measure, for example, of the capacity of a trunk line, is the traffic it will carry during the working hours of the day. During certain hours of the day—the busy periods of the morning and afternoon—the trunk lines are used to their utmost capacity and any one of them is hardly free for more than a few moments at a time. During each connection, as we have shown, the line is for a certain time simply waiting for some step in the operation on the part either of the operator or of the subscriber to be completed; if you quicken those steps, shorten the time of operation, you curtail the time during which the line is unprofitably employed and consequently give it more time free for profitable work. Carry this to a certain extent and you get appreciably more work out of a given number of trunk lines, or you can do the same work with fewer lines, which comes to the same thing. If you can do more work with a given number of lines you require less switchboard space to handle a given amount of traffic, and less switchboard means less operating room space and consequently less building and less real estate. In regard to the trunk line plant, which has naturally to be worked to its full capacity as far as the conditions under which telephone traffic flow allow it to be, it is easy to demonstrate that when a second is dropped from the average message the whole system feels the shock.

* * *

Coming to the main switchboard and the work of the answering operators the same proposition holds good. Here, for the moment, we may disregard the subscribers' lines. As far as they immediately are concerned the saving of a second does not look so important if the average traffic of each line only is considered, as the average use of each line is at present so small; in every place, however, there is always a number of very busy lines and on these the second gained or lost is of the highest importance, while, as has already been pointed out, seconds *lost* on any line may at any time become of great importance in the event of a call being blocked that would have got through had the connection been finished a second or two quicker. Considering only the work of the operators and of the switchboard, it is clear that the size of the switchboard is determined by the number of operators' positions, the number of these in turn is determined by the number of lines that are to be placed at each position and the number of lines per position depends upon the number of connections that an operator can handle in a day.

* * *

This brings clearly before us that the average connection rigorously determines the size of the switchboard for a given daily traffic. If the operator can handle a thousand connections a day the switchboard space required will be only half as much as if the operators each handle only five hundred connections a day. Clearly, if the average connection is completed in twenty-five seconds the operator can handle more calls in an hour than if the average connection requires thirty or thirty-five seconds to complete. In short, here again the gain of a second affects the whole system, down to the very ground on which the exchange is built. Let us assume, for the sake of argument, that an operator's average day's work is a thousand connections. If

a gain of a second is made in the operation of each connection there will be a total gain of a thousand seconds in a day's work, which will enable the operator to handle forty more twenty-five second connections in a day, a gain of four per cent. in efficiency.

* * *

When a second can be shown to have such a value as this there is every inducement to reduce the operation of the average connection to as few seconds as possible. Taking the absolute time necessary for the execution of the various steps required to establish a connection and take it down again, there is no doubt that a connection can be made in much quicker time than the figures we have given for the average connection. But here it must not be lost sight of that it is the *average* connection we are dealing with and that it is only a gain in the time of operating the average connection—a general raising of the standard of efficiency that will effect the general economy throughout the whole system. Therefore the quickest time in which a connection can be made under the most favorable circumstances has little or no bearing on the question of average efficiency, except as showing what can be done if favorable circumstances can be created. The average connection has to be handled under the stress of the rush of work during the busy hours, when connections overlap, when difficulties are created by "busies," by slow answers, by impatient, argumentative and obstructive subscribers, and by the other little hitches that may arise in a complicated machine working at its top pace.

* * *

It is the time of operating this average connection during the full stress of the busy hours that we want to attack, for only by enabling the operators to do more than they are at present apparently doing their utmost can we "make the whole earth feel the shock." During the slack hours a gain in efficiency is of no particular importance as far as producing any economy in the plant or operating expense is concerned. A quick service will of course be appreciated by the subscriber at any time, and night calls are usually urgent calls and should by all means be put through as quickly as possible. But the night traffic of every telephone system is always an extremely small proportion of the total traffic of the twenty-four hours and both plant and staff are practically idle at night. The night service is given because the public demands the facilities for telephoning at any hour during the night, but the amount of telephoning actually done at night is extremely small. Consequently the night staff at any exchange has not enough work to do to keep it even moderately busy and there is no gain to be made by clipping seconds off the time of operating the night connection. What we are trying to do is to make two blades of grass grow where one grew before—to enable the operator to handle more connections during the busy hours of the day; when working at top pressure, than she handles at present.

* * *

There is a familiar proverb to the effect that nothing succeeds like success. On the same principle, if we quicken the work of the operator, that is, reduce the amount of time spent on the average connection, we not only enable her to do more work in a given time, but we enable her to do better work because that which is done smoothly and quickly is better done than that which is done in a complicated and slow way. It is well known that every worker does better and more effective work when kept well keyed up and continuously occupied than when the work is fitful and interspersed with slack periods. This applies to telephone operating as well as to any other mechanical operation, and although we are unable to control the flow of telephone traffic and to regulate exactly the amount that shall go to each operator's position, since the traffic originates with the public, we can gauge it fairly well and shall obtain the best results when each operator is worked to her full capacity. And, as just indicated, that capacity will increase in rather more than direct ratio to the gain in efficiency represented by the actual reduction in the time of operating the average message by reason of the compound interest effect, so to speak, which attends any increase in efficiency. So that a raising of the standard of efficiency produces an indirect gain which can hardly be measured in set terms, as well as a direct gain which can.

The Listening-Key.

Red Cedar.			Chestnut.		
Length.	Circum. at top. 6' from butt.	Circum. 36 inches.	Length.	Circum. at top. 6' from butt.	Circum. 35 inches.
30 feet.	25 inches.	36 inches.	30 feet.	25 inches.	35 inches.
35 "	25 "	38 "	35 "	25 "	37 "
40 "	25 "	43 "	40 "	25 "	41 "
45 "	25 "	47 "	45 "	25 "	45 "
50 "	25 "	50 "	50 "	25 "	48 "

All poles shall be subject to the inspection of this company at points of delivery. Any pole failing to meet the requirements of this specification will be rejected.

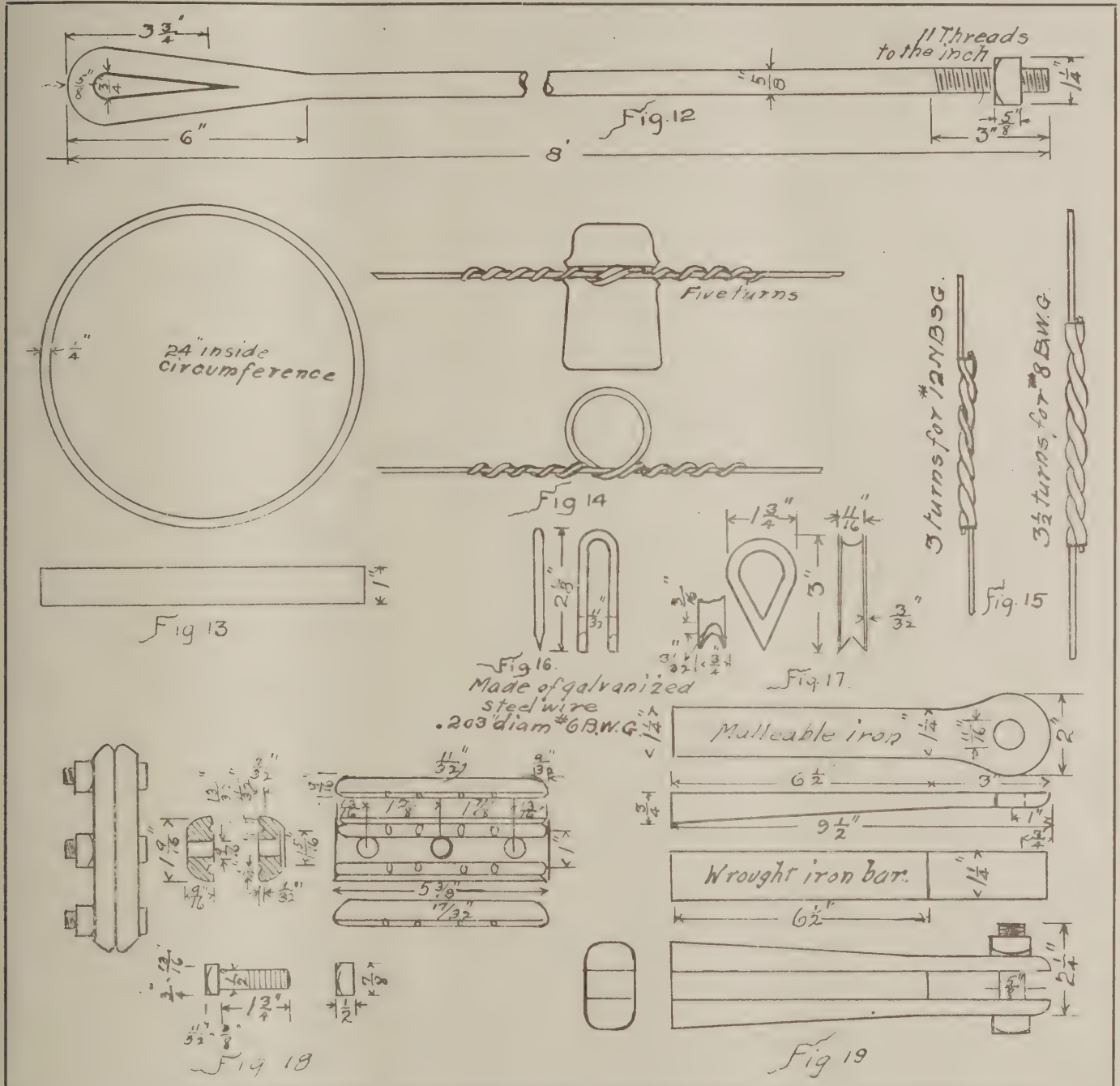
GUY STUBS AND ANCHOR LOGS.—The quality of material for guy

All cross arms shall be thoroughly painted with two coats of metallic paint, mixed in the ratio of 7 pounds dry paint to 1 gallon of pure linseed oil, to be applied with a brush.

PINS.—All pins shall be of good quality, sound, clear, split locust, free from sap and knots. The standard pin shall be $1\frac{1}{2}$ inches in diameter, and otherwise as in Fig. 5.

INSULATORS.—The standard insulator shall be that known as the Hemingray long-distance regular (Fig. 7).

IRON AND STEEL FITTINGS.—All iron and steel fittings shall, unless otherwise specified, conform to standard specifications adopted by bridge builders and be galvanized in such manner as to withstand tests hereinafter specified.



stubs and anchor logs shall conform to the requirements for poles. Guy stubs shall not be less than 25 inches circumference at top. Anchor logs shall not be less than 22 inches in circumference, and not less than 5 feet in length.

POLE BRACES.—Single braces shall conform to specifications covering poles. Double braces shall not be less than 18 inches circumference at top.

CROSS ARMS.—All cross arms shall be thoroughly seasoned, straight grained, Norway or yellow pine, free from such sap wood and knots as would weaken them. They shall be 10 feet long, 3/4 inches thick, 4 3/4 inches deep, and otherwise as shown in Fig. 1.

CROSS-ARM BRACES.—Each cross-arm brace shall be $1\frac{1}{4} \times \frac{1}{4} \times 28$ inches, iron and galvanized, the galvanizing to stand tests herein-after specified. A pair of cross-arm braces shall consist of two braces $1\frac{1}{4} \times \frac{1}{4} \times 28$ inches, one 5-inch galvanized fender drive screw, 2 galvanized 3/8-inch carriage bolts, and 2 galvanized washers to each carriage bolt (Figs. 3, 4, and 11).

CROSS-ARM BOLTS.—Each cross-arm shall be fastened to pole by one galvanized iron bolt 5/8 inch in diameter and proper length to go through arm pole and washers, allowing all threads in nut to take hold. Each bolt shall be provided with two galvanized iron washers of style and dimensions shown in Fig. 6.

GUY RODS.—All anchor guys shall be attached to galvanized iron rods, $\frac{3}{8}$ inch in diameter, of style and dimensions shown in Fig. 12. Each guy rod shall be provided with one nut and one galvanized iron washer, as shown in Figs. 6 and 12.

THIMBLES.—Galvanized iron thimbles of the style and dimensions shown in Fig. 17 shall be used in attaching guys to guy rods.

POLE STEPS.—All pole steps shall be of $\frac{5}{8}$ -inch diameter, 10 inches long, galvanized iron, style and dimensions shown in Fig. 8.

POLE RINGS.—Pole rings, when used, shall be 23 inches circumference inside, 1 inch wide, $\frac{1}{4}$ -inch thick, galvanized iron, and shall be used on corner poles, otherwise shall be as shown in Fig. 13.

LIGHTNING RODS.—Every tenth pole shall be furnished with lightning rod, made of No. 6 extra B. B. galvanized iron wire, as hereinafter specified.

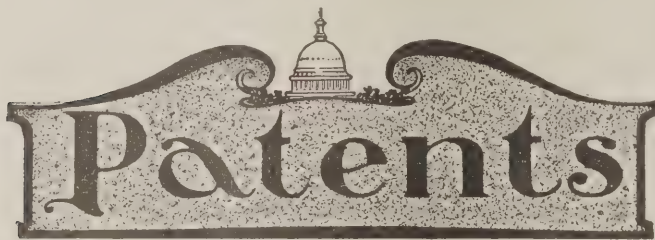
GUY CLAMPS.—Guy clamps shall conform to the standard specifications, which are as follows:

Dimensions.—The guy clamp shall be of the style and dimensions as shown in Fig. 18. Special care is to be taken to have the log curve of the groove the same in both parts of the clamps.

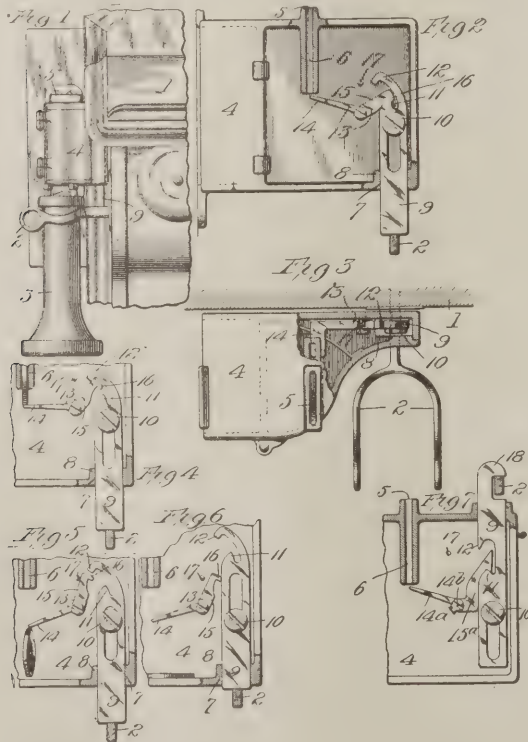
Material.—The guy clamps shall be of the best quality of malleable iron. The bolts are to be of steel and have a breaking strength of not less than 80,000 pounds per square inch.

Finish.—The castings shall be smooth and free from imperfections. The threads upon the bolts are to be carefully recut after galvanizing.

Galvanizing.—The guy clamps, bolts and nuts shall be galvanized and capable of standing tests hereinafter specified.



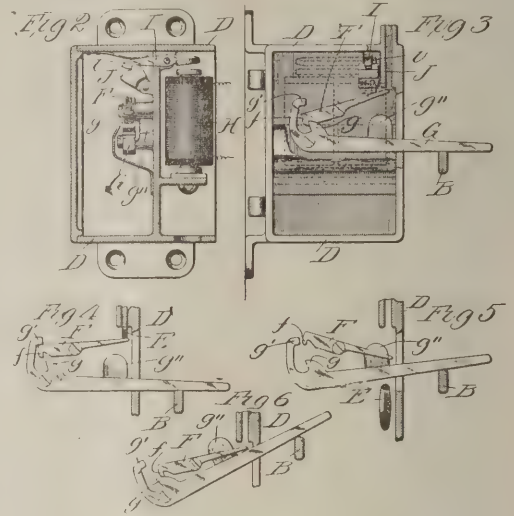
J. P. Moore, of St. Louis, Mo., patents (No. 712,950, Nov. 4, 1902,) and assigns to the Controller Company of America, a telephone lock. The contrivance is shown in Figs. 3 and 4, and consists of a supplementary lock, which may be placed upon any of the ordinary telephone sets. This lock contains a bolt, which im-



pinges upon the hook switch and prevents the hook from rising when the receiver is removed. The insertion of a coin in the

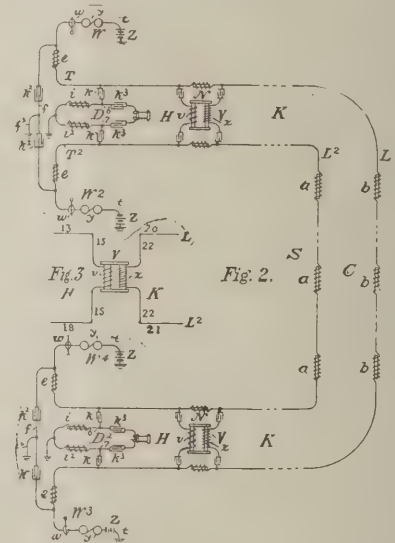
proper slot operates a catch and releases the hook switch, thus permitting the instrument to be used.

E. G. Lewis, of St. Louis, Mo., patents (No. 712,559, Nov. 4, 1902,) and assigns to the Coin Controller Company, of St. Louis, a similar device to all intents and purposes, excepting that the hook switch is provided with a locking lever, and, consequently,



the whole arrangement must be built into the sub-station box. The insertion of a coin operates a trip and releases the hook switch, so that a call may be made. In addition an electro magnet is supplied, which may be energized by the switchboard operator, and the sub-station instrument rendered operative.

Edwin H. Colpitts, of Boston, Mass., patents (No. 712,766, Nov. 4, 1902,) and assigns to the American Telephone and Telegraph Company a method for telegraphing and telephoning simultaneously over the same circuit. This device is apparently a kind



of combination between the old Van Rysselberghe scheme and the patents of Dr. Pupin and C. J. Reed. The object of the circuit is to permit of telephony over a complete metallic circuit, and simultaneously to use the two side lines for telegraphing. Transmission is improved by loading the circuit in accordance with Pupin's method. The diagram in Fig. 2 is practically self-explanatory.

HAS ORDERED BELL INSTRUMENTS OUT.

THE Wichita city council at a recent session passed an ordinance to compel the Missouri and Kansas Telephone Company to remove all its instruments from municipal departments.

In doing this, the city government has not deprived itself of telephonic facilities. For the Wichita Telephone Company has nearly completed the installation of a fine new Independent system.



New Companies

CAYUGA, IND.—The Citizens' Mutual Telephone Company has been organized here.

PRINCETON, IA.—The Farmers' Telephone Line, which is to connect Princeton with Argo, has been organized with W. J. Peaselee as president, Frank Schaeffer as secretary and treasurer, and W. H. Speer as manager. The capital is all paid up, the work of construction is to begin at once, and the line is to be completed within 60 days.

TAMA, IA.—The Pleasant Ridge Telephone Company has been organized with J. H. Linton as president; O. Filloon, treasurer, and E. J. La-Due, secretary.

WAUKON, IA.—The Miners' Telephone Company has been incorporated with a capital stock of \$45,000. The trustees are G. A. Nehrhood, of Waukon, Iowa, D. W. Bailey, of Lewiston, and J. A. Huseby, of Clarkston. The object of the company is to build a telephone line from Lewiston to Ballard's Landing along the Snake River with branch lines extending to the Wallowa and Baker City sections of Oregon and the Salmon River region in Idaho, embracing all the territory lying between Lewiston and Huntington. The organizers of the company are all identified with the Eureka Smelting Company and the Lewiston Southern Navigation Company, and the telephone line comprises a part of the extensive plans now being put into effect by the smelter and boat organizations. It is the purpose to rush the constructions of the line between Lewiston and Ballard's Landing, the branch lines to follow. All the stock of the company has been subscribed except 1,500 shares which will be placed in the treasury.

MOLINE, KAN.—Dr. J. H. Close has formed a company called the Elk County Telephone Company, and taken out a charter for \$100,000, of which the following names are stockholders: J. H. Close, C. F. Plowman, S. C. Hanna, W. A. Elston and Virginia McGreer.

FRANKFORT, KY.—The Marshall County Telephone Company has filed articles of incorporation with the secretary of state with a capital stock of \$5,000.

PINCKNEY, MICH.—The Livingston County Mutual Telephone Company has been incorporated. The company is capitalized at \$10,000, divided into 200 shares of \$50 each, one share giving its holder a telephone with free use of all the company's lines. The shares are non-assessable unless it might be necessary for actual repair work, the running expenses of the company being met by moneys received from line service and rentals. Besides the farmers interested most of the business and professional men in town are stockholders and a good serviceable exchange here is assured.

GRANTHAM, N. H.—The Sugar River Valley Telephone Company of Grantham has been incorporated with a capital stock of \$1,000.

TRENTON, N. J.—The Globe Automatic Telephone Company, of Chicago, Ill., has incorporated under the laws of New Jersey with a capital stock of \$500,000.

UTICA, N. Y.—Articles of incorporation of the Crescent Electric Company have been forwarded to the office of the secretary of state in Albany. The capital stock is \$30,000, consisting of 1,200 shares at \$25 a share. The company will locate temporarily at 191 Genesee street, but as soon as possible other quarters will be secured. The incorporators are William P. Campbell, J. C. Eichmeyer, A. J. Potter, Wm. H. Pryor, Jr., and John Wenzel. The new company will manufacture telephones, police and fire alarm and general electrical apparatus, including telephone magnets, transmitters, receivers, police and fire alarm boxes, gongs, indicators and central office equipments, including storage batteries, charging switchboards and general electrical, mechanical and experimental work of all kinds. New designs and patterns, the patents for which are controlled by the incorporators, will be used. The company is composed of former employees of the Utica Fire Alarm Telegraph Company, who left the company's employ because of differences. All the promoters have had from ten to twenty years' experience in the business.

GASTONIA, N. C.—The Piedmont Telephone and Telegraph Company, of this place, has been incorporated with a capital stock of \$30,000 with the privilege of increasing it to \$100,000.

CLARINGTON, O.—The organization of a new stock company to establish a telephone between here and Wheeling, W. Va., is being rapidly con-

summated. All the stock has been sold, and work will be commenced in a short time. An exchange will be installed here.

ROSEWOOD, OHIO.—The Champaign Telephone Company, of Rosewood, has been incorporated with a capital stock of \$15,000. The incorporators are: M. E. Weimer, T. J. Heck, M. L. Stembel, Peter Weimer, W. H. Fledderjohann and E. H. Eppy.

LAKEVIEW, ORE.—The Lake View and New Pine Creek Telephone Company has been incorporated and a franchise asked of the city council. The incorporators are: D. H. Hartzog, E. C. Thurston, E. Keller, E. H. Gibbons and others.

APOLLO, PA.—The Apollo Telephone Company has been incorporated with a capital stock of \$10,000. Treasurer, Walter J. Guthrie, Apollo. Directors: W. T. Gilkerson, T. M. Willard, H. W. Walker, J. C. Hunter, C. H. Truby, Apollo.

PHILADELPHIA, PA.—The National Electric Signalling Company has been organized with a capital stock of \$100,000 with \$1,000 paid to acquire and operate telephone and telegraph lines. Robert T. Horn, Arthur F. Smith and J. Howard Boyd are the incorporators.

ROOSEVELT, PA.—Charles Wheeler is endeavoring to form a company to construct a telephone line from Irish Lane via Roosevelt to Muhlenburg and Shickshiny.

FULTON, S. D.—The farmers in this vicinity are preparing to organize a company for the purpose of having a rural telephone line extended from this place.

AUSTIN, TEX.—The Texas and Western Telegraph and Telephone Company, of Douglas, Ariz., with a capital stock of \$200,000, has been granted a permit to do business in Texas. The principal office in Texas is at El Paso. The incorporators are: James Douglas, Wm. E. Dodge, Arthur C. James and Cleveland H. Dodge, all of New York City; Walter Douglas, of Bisbee, Ariz.; Joseph Van Vleck, of Montclair, N. J., and Joseph Notman, of Brooklyn, N. Y. This corporation is an auxiliary to the El Paso and Southwestern Railroad, which has more than 400 miles of completed track in Texas, Arizona, New Mexico and Mexico.

LA CROSSE, WIS.—A new corporation known as the Northern Electrical Construction Company, has been formed here with a capital of \$10,000 for the purpose of constructing and operating telephone exchanges and toll lines. It expects to bid on the new line proposed between Chicago and Kenosha.

Rates

BIRMINGHAM, ALA.—The People's Telephone Company of this place has petitioned the council to amend its franchise allowing it to increase rates.

Legal

RAVENNA, O.—A suit has been begun against the Central Union Telephone Company by H. & E. Andrews for \$300 and restoration of lands. It is alleged that the company unlawfully took possession of the plaintiff's land for telephone lines in Rootstown.

Financial

ROCK ISLAND, ILL.—The petition of the Union Electric Telephone and Telegraph Company to have the \$5,000 bond filed by the company guaranteeing it to begin construction within a specified time, has been granted by the council and the \$5,000 returned to the company.

DAVENPORT, IA.—The Davenport and Tipton Independent Telephone Company has increased its capital stock to \$60,000. Extensive improvements are contemplated.

DES MOINES, IA.—The Jasper County Telephone Company has increased its capital stock to \$100,000.

BOSTON, MASS.—The statement of the operations of the Mexican Telephone Company for the month of September and for the seven months of the company's fiscal year to Sept. 30, as issued, shows in detail, and in comparison with last year as follows:

THE WEEK'S MESSAGES *Continued.*

September:	1902.	1901.	Inc.
Gross	\$20,907	\$18,119	\$2,788
Expenses	11,359	9,951	1,408
Net	\$9,548	\$8,168	\$1,380
Since March 1:			
Gross	\$139,937	\$122,660	\$17,277
Expenses	76,805	68,535	8,270
Net	\$63,132	\$54,125	\$9,007

FERGUS FALLS, MINN.—The Fergus Telephone Company has filed amended articles of incorporation with the secretary of state fixing its capital stock at \$100,000, of which \$75,000 is to be 6 per cent preferred.

ST. PAUL, MINN.—The Interurban Telephone Exchange Company, of Douglas County has amended its articles of incorporation and increased its capital stock from \$10,000 to \$100,000, one-half of which is to be preferred stock, drawing 8 per cent. The board of directors has been increased from five to twenty-three, and the officers elected are: H. T. Holverson, president; Thomas Brusegaard, vice-president; Joseph Mathiesen, secretary, and Tollef Jacobson, treasurer.

WHARTON, N. Y.—The Wharton Valley Telephone Company at its annual meeting re-elected the same officers and declared a dividend of 14 per cent..

Elections

HARTFORD, CONN.—At the annual meeting of the Gray Telephone Pay Station Company, Amos Whitney, Franklin Clark, Charles Soby, William Gray, Frank C. Sumner, Hiram R. Mills, and Francis C. Pratt, all of Hartford, were elected directors. The directors organized with the election of the following named officers: President, Amos Whitney; secretary and treasurer, Charles Soby; superintendent, William Gray.

THORNTOWN, IND.—The Home Telephone Company has been reorganized with Elmer Brenton as president, Cal. Graves, vice-president; Geo. Lyster, secretary, and W. O. McKern, treasurer; the above with Ollie Taylor, Robert Coolman, R. Crouch, Will Jaques and J. C. Burton constitute the board of directors.

Franchises

ORLANDO, FLA.—The city council has granted a franchise to the Sanford Long Distance Telephone Company to erect a line in this city, and it is expected that two places will be connected at an early date. Under the terms of the grant work of erecting the poles must begin within thirty days within the city and the line be in operation by February 1, 1903. Rate for service is limited to \$18 per year and the city is to have free telephones.

SAVANNAH, GA.—The following resolution has been adopted by the board of county commissioners: Resolved, That the Ortega Land Company be permitted to construct a telephone line on the road to be opened along the St. Johns River from the city limits to McGirts creek.

BRAIDWOOD, ILL.—The Northwestern Telephone Company applied for a franchise at the last meeting of the city council. It was left in the hands of the street and alley committee for investigation.

DANVILLE, ILL.—A new ordinance for a franchise has been introduced in the council for the Danville Telephone Company. It provides for the installation of a complete underground system by the first of July, 1903, or the forfeiting of \$5,000. When the ordinance was submitted to the council for vote it passed unanimously.

KEWANEE, ILL.—At a special meeting of the city council, the American Electric Telephone Company of Chicago was granted a franchise to construct a system here. Mr. Dodge, the representative of the company, immediately left for Chicago, but will return very soon to begin the canvass for subscribers.

WESTBROOK, ME.—The city council, after a spirited debate passed the ordinance granting a franchise to the Westbrook Telephone Company to construct and operate a system here.

ATTLEBORO, MASS.—A public hearing was given by the Attleboro selectmen recently to the Taunton Telephone Company, which desires to enter Attleboro. Harry S. Williams, of Taunton, appeared for the company. He stated that the company is now ready to start on a system embracing Attleboro and Brockton on the north, Middleboro on the east, New Bedford on the south and Providence on the west. The plan, he said, will then be to form a network of Independent companies around here, and then to join an alliance for offence and defence, with the Independent systems existing in New York State, New Jersey and places in New England. The selectmen took the matter under consideration.

ATLANTIC CITY, N. J.—The Eastern Telephone and Telegraph Company of Camden has applied for permission to erect poles and string wires along the roads controlled by the county. The board instructed the clerk to draw up suitable ordinances, when they will be acted upon.

HOLLY, N. Y.—The Inter-Ocean Telephone Company, of Buffalo, has applied to the city council for a franchise to construct and operate a system here.

OMAHA, NEB.—At the recent election the people voted to allow the Interstate Telephone Company a franchise by about 2,000 majority. This overwhelming sentiment has had much influence with the councilmen, and they are now inclined to give the company a franchise.

MARION, S. D.—J. A. Steninger of Parker has for the second time been granted a franchise to establish a local telephone system at this place, and will at once begin the work of construction. The original franchise granted him was defeated as the result of a referendum election called by local capitalists who believed the franchise should have been granted to home men. This objection was waived.

GAINESVILLE, TEX.—The Independent Telephone Company, of Fort Worth had a representative at a recent meeting of the council. He introduced an ordinance granting a franchise to the company to build a system here. The members of the council, and the public generally are very favorably inclined to granting a franchise to a competing company.

SALT LAKE CITY, UTAH.—The Home Telephone Company has been granted a franchise to construct and operate a telephone system here.

KENOSHA, WIS.—At the meeting of the city council, C. A. Sterling, of La Crosse, asked the council for a franchise to build an Independent Telephone system in Kenosha. The ordinance grants the use of the streets for fifty years, and it is expressly provided that in case the rights of the company are ever sold to any other company so that the competition becomes inoperative all rights granted by the franchise shall cease. The company agrees to bury its wires in the business district and to give lower rates than the Wisconsin company. If the franchise is granted a line will be built from here to Racine to connect with the Citizens' Telephone Company. There will also be connection with the Bristol company, giving a toll service to Beloit, Elkhorn, Janesville, Delavan, and other cities and towns.

Underground

DANVILLE, ILLS.—A new telephone ordinance granting additional privileges to the Vermillion County Telephone Company has been passed by the city council. It extends for a period of thirty years and binds the company with a penalty of \$5,000 to remove all poles by January 1, 1904, and to begin work on a conduit system by July next.

OTTAWA, ILL.—The Home Telephone Company has a force of men digging holes for cable poles. All the wires throughout the fire district will be placed underground.

CHESTER, PA.—The United Telephone and Telegraph Company is planning the construction of an underground system in this city.

Construction

EUREKA SPRINGS, ARK.—The Spring Telephone Company will soon make extensive improvements to its system here. Mr. Hill, the owner, has regained his health and will take personal supervision of the matter. The Bell has asked for a franchise here, but it is extremely improbable that its petition will be granted.

INDIANAPOLIS, IND.—The New Telephone Company will shortly make two important connections. The Home Telephone Company, of Louisville, is extending its lines to Columbus, Ind., by way of Seymour. The new company will connect with the Home Company at Columbus and the local company will then obtain connection with nearly all of Kentucky, at present untouched by the new company, and also with many important towns in southern Indiana. The Kinloch Long Distance Company, of St. Louis, is building its line to Terre Haute, where a connection will be made with the new company. The Kinloch Company is now within sixty miles of Terre Haute, and President Sheerin, of the new company, said that the Missouri connection would probably be made by the first of next year. The connection with the Louisville company will probably be completed within forty-five days.

MANSON, IND.—The directors of the Manson Co-operative Telephone Company will construct new trunk lines to Mechanicsburg and Cyclone.

BANGOR, ME.—The Moosehead Telephone Company, which operates a line from Greenville and points up the lake to Kineo, Northeast Carry, etc., has made application to the railroad commissioners requesting them to determine the matter and manner in which the company may construct, maintain and operate an extension of its telephone line from Greenville to Helob Station upon and along the right of way of the Canadian Pacific Railway.

ST. ALBANS, MAINE.—The St. Albans and Hartland Telephone line is being extended to Ripley, and also east to Corinna.

THE WEEK'S MESSAGES Concluded

FALL RIVER, MASS.—Work on the Assonet and Fall River telephone line has commenced under the direction of Scott Campbell, of Nova Scotia.

ALMA, MICH.—A contract has been closed by the Valley Telephone Company with the Union Telephone Company, of Alma, to build a line south from Flint to Holly and ultimately to Detroit.

LAKE CITY, MINN.—The telephone service between here and Millville has never been what the Dwell Telephone Company has desired it should be, and it has concluded to put in a new line direct from here.

MIDDLETOWN, N. Y.—The Sussex Telephone Company is extending its line to Vernon, N. J., so that connections can be made with this city, Goshen and Warwick.

COLUMBUS, O.—The Citizens' Telephone Company is casting about for a site for the erection of a large building for the offices and switchboard. The present quarters are entirely too small for the business of the company. Manager Beam stated that options have been secured on several sites in that section of the city. None of them have been selected and the matter has been referred to President H. A. Lanman. It is probable that a purchase will be made in the near future. The new site will be near the present one in order to save trouble and expense in moving the switchboard and offices.

FINDLAY, O.—The annual meeting of the board of directors of the Home Telephone Company was held recently. The principal business was to devise some means of increasing the capacity of the local exchange. It was finally decided to duplicate its present capacity. This will be done just as soon as estimates and plans can be decided upon. The board is composed of the following: E. C. Taylor, Findlay, president; Fred. S. Dickson, Cleveland, vice-president; John C. Firmin, Findlay, secretary; R. W. Judd, Cleveland, treasurer.

COOLVILLE, O.—The Home Telephone Company of this place has installed a number of telephones in Belpre and is connecting them with its switchboard. It will soon construct a through line from here to Belpre. A line has been in use between the two points for several months, but there were a number of stations connected on it, making connection between the two towns almost impossible.

COUDERSPORT, PA.—At a meeting of the stockholders of the Coudersport Telephone Company recently, it was decided to expend about \$1,000 at once in putting the system in the best possible condition.

MILROY, PA.—The Commercial telephone line is now being extended from Milroy to Lewistown, and will be open for use in a few weeks, making a direct line from Bellefonte to Lewistown.

MONTROSE, PA.—The Montrose Telephone Company has ordered a new central energy switchboard and intends having it in use on or before the first of January.

WAYNESBURG, PA.—The Standard Telephone Company of this place is constructing a line to connect with the Federal to Pittsburg.

COLTON, S. D.—At a meeting of those interested in the telephone system at this place, committees were appointed to determine upon the routes for several extensions of the system to communities and towns in this vicinity. It is expected that arrangements will be made to construct lines to Hartman, Baltic, Hartford and other towns.

FAIRMOUNT, W. VA.—The construction gang of the Consolidated Telephone Company is constructing a new line from here to Mannington. Other cities and towns that have heretofore not had telephonic communication, will also be included in the circuit.

ASHLAND, WIS.—The Home Telephone Company will construct a new toll line to Abbotsford. A long distance line will also be built to Washburn, and in the near future the Home Telephone Company will install an exchange at the latter place.

OCONTO, WIS.—Paul E. Sauer and H. J. Spitzman are building a telephone line from New Munster to Hales Corners and Powers Lake. Dr. Flett of Waterford is building a line from Waterford to Honey Creek.

Miscellaneous.

FRANKFORT, KY.—The Frankfort Telephone Company has completed its long distance line to Louisville, and is now connected with the Louisville Home Company.

BALTIMORE, MD.—The Maryland Telephone and Telegraph Company has extended its lines so as to reach Mount Washington. For the present this service is being supplied by the Roland Park sub-exchange, but ultimately a new station may be established.

BALTIMORE, MD.—The Maryland Telephone and Telegraph Company has its line from here to York, Pa., completed, and working. It is expected that the line to Philadelphia will be completed by December.

RICHFIELD SPRINGS, N. Y.—Connection between the local telephone line and the system which covers Herkimer, Ilion, Mohawk and Frankfort

has been established. There are nearly 800 telephones in those four villages and this extension places the people of this village in direct communication with them.

KLAMATH FALLS, ORE.—A telephone line has been completed from Klamath Falls to Merrill and several intermediate ranches have secured connections. The company's workmen are now engaged in extending the line to Bonanza.

STAUNTON, VA.—The Augusta County Telephone Association met in semi-annual session recently. John W. Todd presided and J. S. Richie acted as secretary. A special committee composed of J. W. Churchman, A. H. McCue and A. H. Towberman, were appointed to interview N. C. Watts as to the future relations after the expiration of the present contract. The contract doesn't expire until December, 1904, but the association wants to begin negotiations early so as to be in condition to look out for itself if the contract with Mr. Watts is not renewed.

Personal

DES MOINES, IA.—F. R. Hocker, of the Audubon County Telephone Company, was in the city recently in consultation with Manager Bandy, of the Hawkeye Telephone Company with reference to the toll lines which the latter is now building from Guthrie Center to Audubon.

SIOUX CITY, IA.—J. H. Quick, a well known lawyer and politician, has abandoned the practice of law and will manage the Automatic Telephone Company with headquarters here.

CANTERBURY DEPOT, N. H.—C. W. Carter, general manager, and L. A. Glines, secretary and treasurer of the Canterbury and Boscaawen Telephone Company, have forwarded their resignations to the board of directors. No action has as yet been taken by the board, and presumably the two men will act until their successors are appointed. Strenuous efforts are being made to connect the local line with the long distance service.

THE CHINAMAN AND THE LONG DISTANCE

"A CHINAMAN at the telephone is a funny thing," remarked a long-distance telephone operator a few days ago. "You see it is impossible to tell whether one person or half a dozen are talking, and we often become mixed up in listening to them. When one is speaking it seems as if half a dozen are talking, and we often imagine the wires are out of order. To make matters worse, the Chinese delight in talking as fast as possible, and we never know whether the Chinaman at this end of the wire is talking or if it is the one at the other end. After the conversation is ended the Chink walks out of the booth with a self-satisfied smile on his face, and pays for a three-minute talk. We have lately discovered that he invariably says as much during that time as could have been said by a white man in fifteen minutes."

To be sure, the telephone company is not really "out" anything by the transaction, as it is paid by the minute, but nevertheless in the case of the Chinaman, the company would be the gainer by charging for volume instead of time. A Chinaman always begins his talk in pigeon English. He says: "Hello! Is this Sam Ling? I bette you don't know—yi hi yi he yahbo benno ne—" and so on, and it sounds on the wires as if several persons were at work.

A most amusing incident occurred in the Denver office of a long-distance telephone company the other day, as chronicled in the Rocky Mountain News. The long-distance operator at Colorado Springs called Denver over one wire and informed the local office that another wire was out of order. An investigation resulted in a report being made to the effect that the wire was crossed with a dozen others, and that it was impossible to use it until the trouble could be located. An inspector asserted that he believed the wire was crossed with one connected with the tower of Babel, and the "hello girls" upstairs were ready to agree with him, when a Chinaman walked out of a booth, glared around the room for a minute and then said:

"Me notte pay when big fool monkey with me and call me names allee samee me notte know any bettee. Me wantee talk to Sam Lee, Trinidad, not Melican mans and gals in Denver."

And the mystery was explained. What had been mistaken for a crossed wire was only two Chinamen, one in Denver and one in Trinidad, each one trying to get his money's worth of conversa-

tion at so much per minute. The Mongolian received an apology and was once more allowed to enter the booth, when he talked to his friend, Sam Lee, in Trinidad. Sam Lee is agent for the Six Companies of San Francisco, and furnishes laundrymen and merchandise for Chinamen all over the United States. He averages five talks to Denver each week, and were his conversations carried on in English his business would be very profitable for the telephone company. Sam, however, is too wise to talk English when he has to pay, and converses in the language of the Flowery Kingdom. In this manner he saves a great deal of money.

A CHANCE FOR INVESTORS.

PINE PLAINS, N. Y., wants a telephone system. It is not particular about having a local exchange, but it at least wants long distance connection. But the editor of the Pine Plains Register tells very succinctly what the town wants. Here are his words:

"It is high time Pine Plains had some means of communicating with the outside world. The idea of a village of 600 inhabitants, with a high school, four churches, street lamps, flag walks, water works, fire company, brass band, three railroads, a first-class newspaper, fine hotels, up-to-date stores, intelligent men and women, scores of pretty girls, and lots of other things away ahead of most country places—the idea of such a locality having no means of finding out the result of a State election until the next day when somebody comes from some other place and tells us how it has gone. Now, wake up, secure the long-distance telephone, and get in communication with progressive settlements. Pine Plains has been hidebound, lo, these many years, and it is now time to get a move on."

TRADE NOTES

THE CALCULAGRAPH COMPANY, 9, 11 and 13 Maiden Lane, New York City, has just installed a number of its toll timing machines on the toll switchboard of the Dakota Central Telephone Company. Many other Independent exchanges have placed orders for the calculagraph, and they will be filled as soon as possible.

THE W. G. NAGEL ELECTRIC COMPANY, of Toledo, Ohio, is enjoying a very flattering trade on its line of "Ready Specialties" along with its regular line of telephone supplies. One of its leaders is a Marline hanger, made in two styles, which it is offering at greatly reduced prices. Its estimate sheet, giving complete list of material required in the construction of telephone plants, is mailed free upon application.

JAMES S. BARRON AND COMPANY, New York, are selling a good cleaning and polishing preparation, known as "Paul's Glittering Metal Pomade." It is especially adapted for use by telephone inspectors for cleaning and polishing telephones, and for use around switchboards, delicate instruments and fine machinery. All stains are removed by this pomade, leaving a clean and polished surface. It is free from all mineral acids. The company will send descriptive literature on this and their other specialties to those interested, and also quote prices.

THE VOGHT-BERGER COMPANY, makers of telephones and switchboards, La Crosse, Wis., has planned, owing to the fact that it is months behind with orders, to entirely remodel its present factory. The work will be completed as soon as possible. The woodwork now being done by outside firms, will in the future be done at the factory. All the cabinet work which the company needs in connection with the manufacture of telephones and switchboards will be manufactured in its own factory, and when completed a large number of new men will be needed to handle the work. Nearly \$5,000 worth of machinery has been purchased for this department alone.

THE ELECTRICIAN, the well-known electrical journal of London, is gathering data for its Electrical Trades' Directory and Handbook for 1903. This will be the 21st year of publica-

tion of the directory, and the publisher desires to make it the most complete ever gotten out.

With this end in view, he desires to get every telephone manufacturing and supply house in this country into the directory. The book will contain a carefully compiled list of British, colonial and foreign electricians, and all those employed in the electrical trades.

Names for insertion in this directory should be sent to *The Electrician*, Salisbury Court, Fleet street, London, E. C.

PLANTS FOR SALE

Advertisements under this head \$1.00 for 25 words or less for each insertion. Prepaid.

LEASE:—Wanted to lease telephone or electric light property, by practical, all around electrical man with some capital. Address CAPITAL, care AMERICAN TELEPHONE JOURNAL, New York.

FOR SALE—One of best equipped telephone exchanges in Kansas; price, \$22,000; upon which amount plant now NETS 23 per cent. If you mean business, address X for particulars, care of AMERICAN TELEPHONE JOURNAL, New York.

WANTED

Advertisements under this head, 25 cents for 25 words or less for each insertion. Prepaid.

WANTED—Sober, reliable young man as superintendent of 200 subscriber plant and outside work. Must be thoroughly competent in switchboard and instrument work of magneto and common battery system; hustler, capable of maintaining plant to highest efficiency, and know how to get best work from employes. Address, stating experience, references and salary expected, TELEPHONE, Lock Box 93, Elizabeth City, N. C.

POSITION WANTED by strictly temperate man, 25 years old, with seven years' experience in Independent and Bell systems. Experienced in all branches of work. References from former and present employers. South preferred. Address EXPERIENCE, care AMERICAN TELEPHONE JOURNAL, New York.

MANUFACTURERS: An engineer, experienced in designing common battery apparatus, and with excellent references, desires position with a good telephone manufacturing company. Address ENGINEER, care AMERICAN TELEPHONE JOURNAL, New York.

TRANSFER BOY, age 18; nearly two years' experience, wants position in exchange of 150 to 500 subscribers Western town preferred. Address TRANSFER, care AMERICAN TELEPHONE JOURNAL, New York.

EXCLUSIVE handling of an account, for Chicago trade, beginning January 1st. Manufacturers Agency basis. Address SALESMAN, care AMERICAN TELEPHONE JOURNAL, Monadnock Building, Chicago.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISSELL CO., Toledo, Ohio.

POSITION as wire chief in central energy exchange of from one to two thousand subscribers; 9 years' experience; best of references. A. B., care AMERICAN TELEPHONE JOURNAL, New York.

A HOME IN SOUTHERN CALIFORNIA—I desire to communicate with a man capable of taking charge of a factory for insulating rubber-covered National Code wires. This is a splendid opportunity for the right man. References given and required. No money necessary. Address P. O. BOX 1116, Los Angeles, Cal.

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SOME STEPS IN THE EVOLUTION OF CIRCUIT DESIGNS

ARTICLE I.—THE SERIES SUBSCRIBER'S SET

By J. C. KELSEY

DURING the life of a quarter of a century telephone circuits, in common with other human contrivances, have passed through an evolutionary period and are now beginning to settle down into a few well-recognized, fairly definite and probably permanent typical forms. To trace the steps that have led to the present design is interesting to the electrical historian and instructive to the practicing engineer.

The leading characteristics of early switchboards still survive in those of modern type. The line signal was a drop because a magneto yielding alternating currents was supplied at the sub-station, and in calling, the subscriber gave a few turns to the crank, thus necessitating a shutter signal, which would fall and remain exposed until the operator noticed it. Common battery



FIG. 1.

boards are supplied with signals actuated by a continuous, not an alternating, current, so the magneto at the sub-station is dispensed with, and the calling signal displayed automatically by the effort of the subscriber in removing the receiver from the hook. The early switchboards cut off the line signal during conversation, and so do the very latest common battery designs. The primitive switchboard had disconnect signals; so also has the modern board. The chief difference is that the disconnect signals of to-day are operated automatically by the replacement on the part of the subscriber of the telephone receiver on its hook.

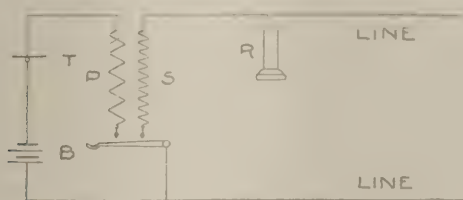


FIG. 2.

The early boards had a reliable busy test for the multiple, and in this respect modern systems have but little advanced, except in the ingenuity required to preserve all functions of the busy test, without interfering with other circuit features. Early boards had not to contend with inductive disturbances, and when these appeared in the earth currents of the trolley system the only solution was to make all telephone lines metallic; but this, however, made no general change in local battery systems.

The chief distinction between old and new switchboards lies in trunking methods. Disconnect signals are largely made automatically, dependent upon the replacement of the receiver, though, in some cases, the subscriber's operator with whom the call originates has control of the disconnect attached to the trunk that is used. The early operator used to ring upon the trunk lines, but

was soon provided with an order wire. In so far as the reversed call circuit is concerned, the operation of new and old boards is identical.

In the analysis of local battery telephone systems it is well to begin with the subscriber's talking set. Here, in the battery as

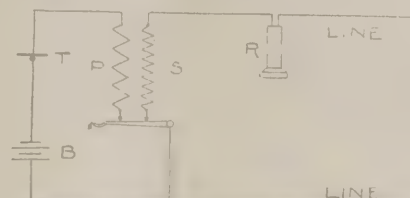


FIG. 3.

the source of motive power, will be found the seat of much trouble. The sub-station set seems a simple affair, but when it is remembered that a single manufacturing company presents some 200 types of sets, matters become complicated. Fig. 1 shows a sketch of a local battery set, T representing the transmitter, R receiver, B the battery, P and S primary and secondary of the induction coil.

The transmitter, battery and primary of the coil form a local circuit by themselves, while the receiver and secondary of the induction coil are placed in the line. A switch is necessary, so ar-

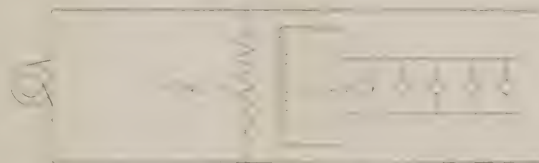


FIG. 4.

ranged as to close the battery circuit when the telephone is in service and to open it when out of commission, in order that the battery may not be quickly exhausted.

Fig. 2 shows the arrangement of the hook switch when the telephone is in its place, while Fig. 3 shows the circuits closed with the instrument in use.

The student often mistrusts this arrangement, imagining that the current will escape into the line and be wasted. But it must be recollected that the local circuit of the transmitter, battery and primary is of very low resistance in comparison with that of the

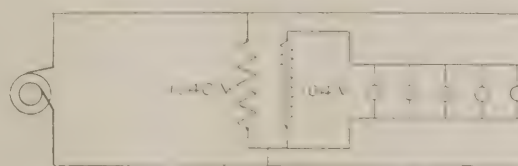


FIG. 5.

external line, so that only a very small fraction of the battery energy could be thus dissipated.

A somewhat similar example in electric light construction is shown in Fig. 4. If the windings of the transformer were connected in the same manner as the telephone induction coil (Fig.

5), there would be no change in the operation of the lighting circuit, but the danger of the public would be increased, for, in

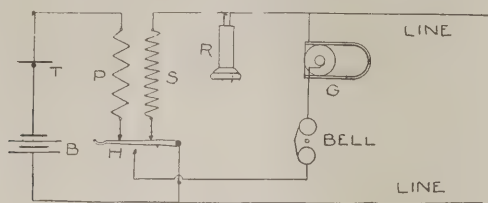


FIG. 6.

case of defective insulation, a person touching the low-pressure supply mains would be likely to receive a fatal shock. With

telephone circuits there is, however, no question of this description. The same switch is also arranged to open and close the magneto generator and ringer circuit operating in the reverse order, that is when the telephone is out of service, the magneto and ringer are in circuit, and conversely, when one is talking these parts of the instrument are excluded.

Fig. 6 shows the arrangement of the switch when the receiver is off the hook and the ringer circuit open; while, when the receiver is in place, the ringer circuit is closed.

As the armature of the magneto generator has considerable impedance, it will weaken the ringer current so greatly as to require a short-circuiting device to cut out the armature when out of use, and to automatically remove this short-circuit as soon as the crank is turned. In the series bell, therefore, the hook separates the talking and ringing circuits.

TELEPHONE CIRCUITS—II

By H. P. CLAUSEN

FIG. 52 shows well-known vibrating electric bell diagram that has been so universally adopted as to be standard.

Fig. 53 is a single stroke bell, while Fig. 54 indicates a vibrating single magnet bell. Fig. 55 represents a well-known direct current buzzer, while Fig. 56 represents an alternating cur-

REPEATING COILS.

Owing to the many uses of repeating coils in telephone circuits, a number of types are shown; thus Figs. 63, 64, 65 and 66 show forms easily drawn and always correctly understood when appearing in diagrams of circuit connections.

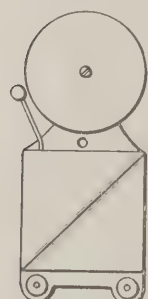


FIG. 52.

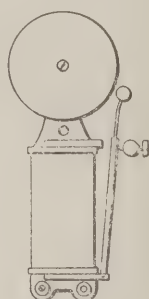


FIG. 53.

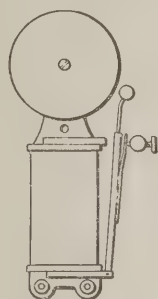


FIG. 54.

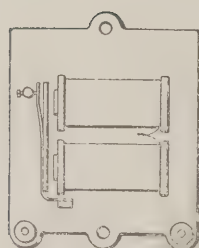


FIG. 55.

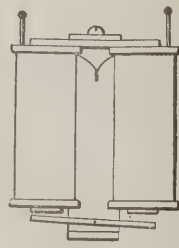


FIG. 56.

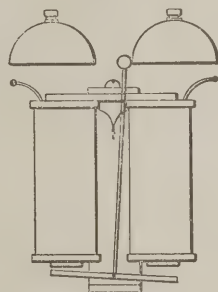


FIG. 57.

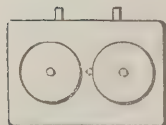


FIG. 58.

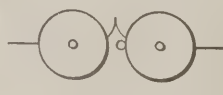


FIG. 59.



FIG. 60.

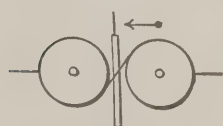


FIG. 61.

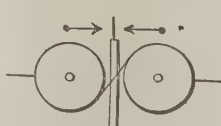


FIG. 62.

rent buzzer, and Fig. 57 an alternating current or magneto bell. Fig. 58 shows a simple form of extension bell diagram, and Fig. 59 a ringer or magneto bell diagram. By Fig. 60 a minus polarized circuit closer is shown, while Fig. 61 shows a plus polarized circuit closer, and Fig. 62 a plus and minus circuit closer.

EDITOR'S NOTE.—Mr. Clausen's first article appeared last week. There will be about 50 in the series.

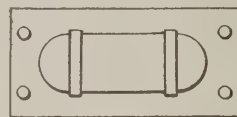


FIG. 63.

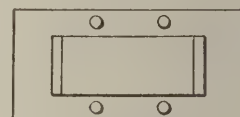


FIG. 64.

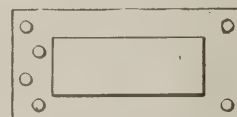


FIG. 65.

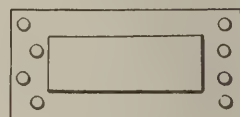


FIG. 66.

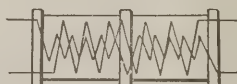


FIG. 67.

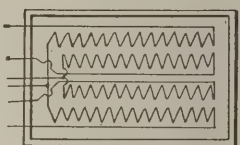


FIG. 68.

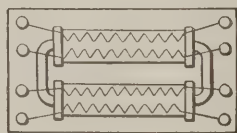


FIG. 69.

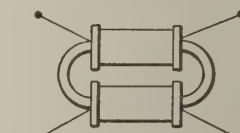


FIG. 70.

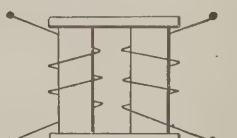


FIG. 71.

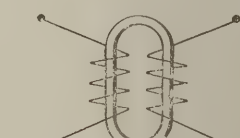


FIG. 72.

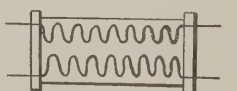


FIG. 73.

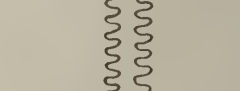
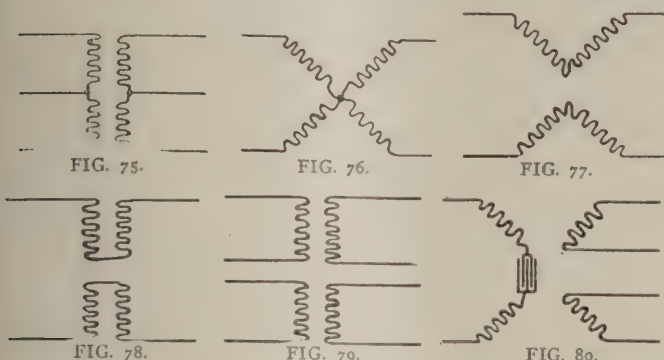


FIG. 74.

Where it is necessary to show more detailed connections in the primary and secondary windings, Fig. 67 may be used, while in some cases Fig. 68 has been adopted, although Fig. 69 is preferable. In Fig. 69 it will be observed that the two halves of the repeating coil are divided into two windings and all brought out into connectors, thus permitting of a great many combinations. Where a simple and expressive repeating coil or transformer

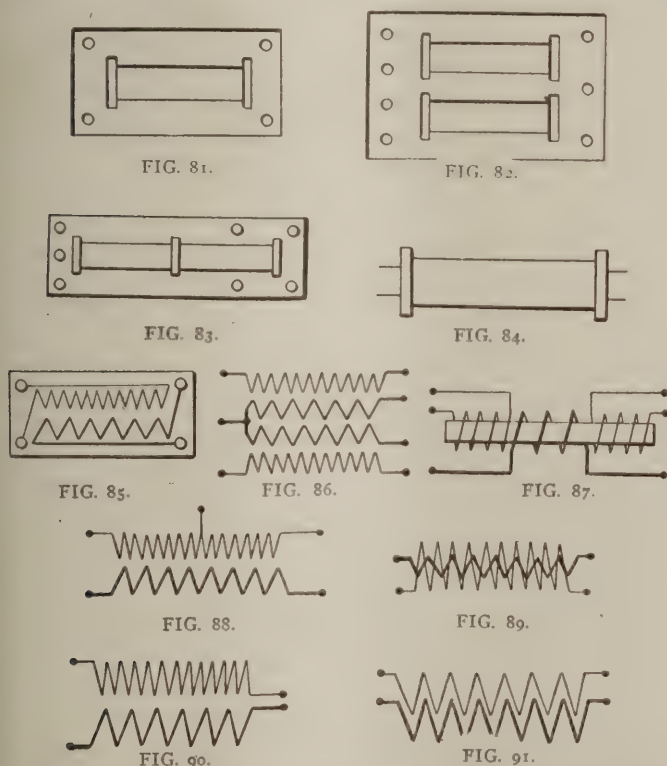
diagram is demanded, Fig. 70 is desirable, while Fig. 71 may be used as a more correct electrical diagram; or, possibly, Fig. 72, giving closed magnetic circuit. For extreme simplicity Fig. 73 meets requirements. For purely electrical diagrams Fig. 74 shows the simplest form. When it is necessary to connect to the center of the repeating coil windings use Fig. 75, while Fig. 76 shows the inner ends of the repeating coil tied together, and in Fig. 77 the center is left open for the possible reception of battery, relay or condenser connections; the same is true of Fig. 78, while Fig. 79



shows a divided coil, where each of the windings stand separated and permit of being connected to condensers, battery or other apparatus. Fig. 80 gives an idea of connections which may be established by modifying previous diagrams.

INDUCTION COILS.

Diagrams of induction coils are represented only by well-known diagrammatic forms, thus Fig. 81 shows a single induction coil with four terminals, representing two primary and two secondary connections. Fig. 82 represents two coils mounted on one base with the circuit connections, as shown in Fig. 86. Fig. 83 is a diagram long used by the Bell, and represents the well-known operator's telephone or "split type" induction coil. Fig. 84 shows a simple mechanical diagram of an induction coil, while Fig. 85 shows a combined mechanical and electrical diagram, plainly specifying the primary and secondary windings by respectively heavy and light lines. This diagram has largely been used by telephone circuit draughtsmen, while Fig. 86 shows

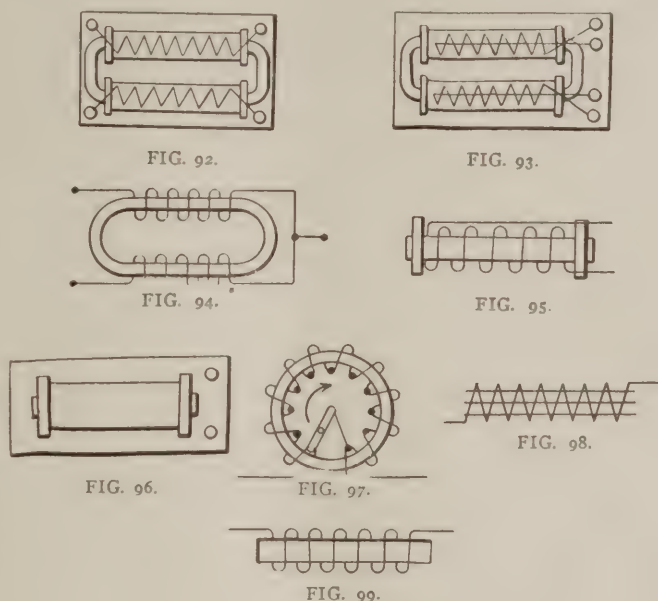


a special type of coil, the mechanical representation of which is shown by Fig. 82. Fig. 87 gives a very simple and expressive diagram of a switchboard operator's induction coil. It will be observed that the primary is shown by heavy lines and that it is wound upon the same core with two separately placed, though

usually parallel wound secondaries, one of these windings going to the switchboard operator's telephone circuits, while the other connects to the monitoring operator's circuits. In Fig. 88 there is the primary and secondary winding of an induction coil with the center of the secondary winding brought out to a terminal. Fig. 89 represents a rather wierd diagram of an induction coil, but one which has been found in favor, as it intimates that the secondary winding is placed around the outside of the primary. Fig. 90 or 91 appears much preferable.

IMPEDENCE COILS.

Fig. 92 shows a form of impedance coil which might be mistaken for a repeating coil and, in fact, is sometimes used for this piece of apparatus. Fig. 93 shows another form of impedance coil



which has found favor, while Fig. 94 is an impedance coil with the windings differentially connected. Fig. 95 gives another form in which a more easily drawn core is provided, and Fig. 96 a plain mechanical diagram of Fig. 95 construction. By Fig. 97 an adjustable impedance coil is shown. Usually telephone engineers adopt either Figs. 98 or 99. The writer prefers Fig. 99, as it permits of drawing some zig-zag lines and making an impedance coil diagram by simply adding a few lines through the zig-zag diagram, conveying the idea of magnetic retardation, while the omission of the lines permits of using the zig-zag as a simple resistance.

INTER-STATE CONVENTION.

SECRETARY E. M. COLEMAN has sent out a handsome program of the Inter-State Telephone Association Convention to be held in Chicago on December 9, 10, 11. The program was printed in full in a recent number of THE AMERICAN TELEPHONE JOURNAL. Every detail for the approaching convention, and the entertainment of delegates and guests, is being worked out by the various committees. The arrangements are being made on a scale that will make this convention the greatest gathering of business men ever held in this country. Every Independent telephone man, whether he reside in the nine states embraced in the association, or whether he be interested in operating, construction or manufacturing, should make it a point to attend this gathering. Headquarters will be at the Auditorium Hotel. Mr. Coleman has prepared the following notice in regard to railway fares to those attending the convention from any point in the nine states:

"All persons who attend the meeting of the Inter-State Independent Telephone Association should secure certificates from railroad agent where tickets are purchased, which entitles them to a rate of one-third fare on the return trip. If through tickets can't be secured from starting point, take certificate from each agent where ticket is purchased. Present your certificates to E. M. Coleman, secretary, at Chicago meeting for endorsement."

A PRACTICAL METHOD OF KEEPING TRACK OF TOLL LINE REPAIRS AND EXPENSES

By WILLIAM H. HYDE

PROVIDE the lineman or manager in charge of each district with a supply of the two forms as shown in Figs. A and B. Fig. A is the repairers' trip report, which should be forwarded to the wire chief immediately upon the

tered in detailed order on the summary voucher they can be readily checked with the "Monthly Report of Toll Line Repairs and Expenses" and the expense verified by the wire chief from his daily reports. This monthly report of "toll line repairs

FIG. A.

TOLL LINE REPAIRER'S TRIP REPORT	
.....District.....190..	
At.....M.	Received orders from.....to go out on.....line, for.....
Departed at.....M. Found Trouble at Pole No.....at.....M.	
.....miles from.....Caused by.....	
Work done.....	
Material Used.....	
Returned at.....Delayed by.....	
.....Labor.....Livery or R. R. Fare.....Repairer's Expenses.....Total	
Lineman (or Manager)	

Forward to Wire Chief, Immediately on Lineman's Return

lineman's return from each case of trouble, giving all the particulars as noted on the printed form.

These trip reports should be entered on the "Wire Chief's Daily Report" (see Fig. C—length of blank to suit the require-

and expenses" must agree with the "Daily Trip Reports" sent in, as to date, time employed, material used, labor employed, livery, etc.

To avoid a second trip, linemen should be instructed when

FIG. B.

MONTHLY REPORT OF TOLL LINE REPAIRS AND EXPENSES								
DATE	LOCATION AND DESCRIPTION OF WORK DONE (STATE FULLY)	TIME		MATERIAL USED	LABOR	Cost of R. R. Fare or Livery	Repairer's Expenses	TOTAL
		Started	Returned					

INSTRUCTIONS:—You will make herein a full explanation of all toll line expenses during the month, showing the items of expense and material used as indicated above. Enter the amount of each voucher separately.

ments). The manager should keep a duplicate of these trip reports and enter them on the "Monthly Report of Toll Line Repairs and Expenses" (see Fig. B), to be sent in to headquarters with the regular monthly expense vouchers.

sent out on toll line trouble to take with them a sufficient supply of material, so that they can make any necessary toll line repairs that they may notice, such as broken glass, slack wires, wires off pins or brackets, etc., although this may have

FIG. C.

WIRE CHIEF'S DAILY REPORT OF TOLL LINES							
190							
STATION	Time Re- ported	NATURE OF TROUBLE	Ordered Repaired by	Time	Time Clear	Expense	TROUBLE AND WHERE FOUND

Managers should be instructed when making out vouchers for toll line expenses to keep each trip together, and note on each voucher just what the expense was for, giving the line, nature of trouble, etc., so that when these vouchers are en-

nothing to do with the special trouble they were sent after. By doing this a great deal of unnecessary trouble and labor may be avoided.

EDITOR'S NOTE.—Length and depth of forms to suit business.

IN THE OPERATING FIELD

HOW A COMPANY WAS STARTED

A TELEPHONE system operated in Botetourt County, Va., is typical of the growth of many small Independent companies. The Botetourt Telephone Company was the first line organized in the county. It started with a line from Buchanan to Fincastle, with branches to Arch Mills and Lithia. J. C. Brewbaker, of Botetourt, constructed the line, and he has always taken an active part in its affairs. For some time there was no switchboard, and the entire service was done through the telephones on the single line of wire. As the business increased a switchboard was purchased, and with the establishment of the switchboard many of the business men in Buchanan and along the line got telephones. During the past year the line has been extended down the county, so that Roaring Run, Rocky Point, Indian Rock and Appold are now connected with the system. There are forty-one telephones on the line, all connected through the switchboard in Fincastle with telephones on the line of the Roanoke and Botetourt line.

Mr. O. E. Obenshain is the president, and Mr. George S. DeLong, of Lithia, the secretary of the Botetourt Telephone Company. The expenses of the line are maintained by a rental charge of 50 cents per month against each subscriber, (40 cents in case the subscriber is a stockholder), and 10 cents per message charged those not subscribers.

There is talk of an extension of the line up the river, and in other directions. The connections make the use of the line indispensable to the business of those who once become subscribers.

For a trifling charge one can talk to almost any point in Botetourt, and to Roanoke, Salem and Vinton.

TO IMPROVE ITS SERVICE

THE Citizens' Telephone Company, of Grand Rapids, Mich., is preparing to increase its authorized capital stock from \$1,000,000 to \$2,000,000, the stockholders having been requested to give the trustee authority to file amended articles of association for this purpose and to increase the directory from 10 to 11 members. The purpose of this action is not to secure funds for enlarging the company's field, but to better the present service and to carry on the improvements already laid out and contemplated. Secretary Fisher stated that only such part of the increased capital stock will be put out as will be required to carry on the improvements long planned and to meet the necessary investments required for the increased service. The approval of more than half of the stockholders to the proposition has been secured without a single exception. The company's system now includes fifty-three exchanges, and the increase in the number of telephones since November 1, last year, has been 3,800, of which 1,167 were in Grand Rapids.

MEETING OF COUNTY ASSOCIATION

THE Independent Telephone Association of Boone and Hamilton counties, Indiana, held a meeting at Lebanon recently. The Lebanon Telephone Company was represented by W. A. Buntin, Philip Adler and C. M. Zion; the Citizens' Telephone Company, of Zionsville, by J. W. Brendel and H. J. Gallimore; the Central Indiana Telephone Company, of Sheridan, by L. E. Cox; the White Star Telephone Company, of Westfield, by W. W. Mendenhall; the C. B. Jones Telephone Company, of Baker's Corner, by C. B. Jones.

The purpose of the association is to promote and protect the interests of the members and to adopt measures that will benefit patrons of the companies and extend the service.

The next meeting will be held subject to the decision of the advisory board in May. It is probable it will be held in Sheridan, Indiana.

TAXING OF TELEPHONE POLES

AN ordinance has been introduced in the city council of Carlisle, Pa., providing for the taxation of all poles in the city. The provisions of the ordinance are as follows:

That hereafter when permission is given by town council to

any party, before any poles are erected, to specify to the burgess the size and number of poles and places where they are to be erected. If any objection is made the burgess is to decide and to issue a license. No poles are to be erected before license is issued. License fee is 50 cents for each pole.

It provides that the burgess shall cause an inspection to be made at least once a year of all poles, and if any pole be found defective he shall notify party owning it, who shall replace the same with a sound pole, and if he refuses or neglects for ten days to so replace it he shall be liable to a fine of one dollar for each day he shall continue to do so.

It provides that the owners of poles now erected shall name and number the same with their initials and a distinctive number in oil paint. Further, that on the first Monday of January of each year owners of poles shall make application to the burgess for a license to maintain them during the year, specifying the poles so to be maintained, and the burgess shall issue a license for one year, the license fee to be twenty-five cents for each pole.

IT WANTS FIFTY YEAR FRANCHISE

BUTTE, Montana, has passed an ordinance requiring the Rocky Mountain Bell Telephone Company to put all its wires in underground conduits. It gives the company two years in which to do this. Although the Bell Company there now has a franchise, it seeks to make this ordinance an excuse for tightening its grip on the monopoly of the telephone business in Butte. It asks that it be given an exclusive franchise to run for fifty years. This is another instance of the very plausible tactics employed by the Bell to keep the telephone business of the country in its own hands. It sometimes succeeds by these tactics, but even it has to admit that it has met many ignominious defeats in recent years at the hands of the people and the Independents.

BADGER STATE LONG DISTANCE COMPANY

C. W. TWINING, of Monroe, Wis., president of the committee on reorganization of the Badger State Long Distance Telephone Company, has mailed a letter to stockholders informing them that parties well backed financially propose purchasing the various interests represented in the company and offer \$25 for each of the 270 shares or to exchange for each share \$50 of stock in the next organization. Foreclosure proceedings have been started on the bonds issued and the property must bring more than \$40,000 in order to leave anything for stockholders. The transfer must take place before the sale by foreclosure, which will undoubtedly wipe out the stock.

It is stated that it is too early to complete the details of the reorganization, but the stockholders are assured that the company will remain Independent and that the property will be put in the very best condition. There is some fear that if the property is foreclosed of the possibility of falling into the hands of the Bell company.

The stockholders are told that the new management will extend the lines to connect with Burlington, Corliss, Racine, Kenosha and Milwaukee when the necessary exchanges are installed; also, with Freeport, Rockford, Whitewater, Waukesha and probably copper connections will be made with Elgin, Aurora and the Fox river valley lines in Illinois.

CHEERFUL NEWS

THE Bell Telephone Company recently applied to the city council of Granville, O., for a franchise. Granville already has a telephone system, operated by an Independent company. It gives excellent service at very reasonable rates, and the council saw no good reason for giving the Bell a franchise. After deliberating duly over the matter, it told the Bell Company that a franchise would be granted. It imposed the stipulation, however, that the Bell rates would have to be lower than the Independent. There will be no Bell exchange in Granville.

Opinion and Comment

INDEPENDENT TOLL AND LONG DISTANCE LINES

FROM the news that is now coming in through the columns of "The Week's Messages," it appears that a wonderful development of toll and long distance connections between Independent exchanges, a development far exceeding any so far recorded, is now taking place. For the last two or three months, a notable increase in the building of toll and long distance lines has been noticed, that is steadily growing. The toll line systems of the Independent telephone companies have reached a far greater state of perfection than the Bell toll lines. They not only cover more territory, but they give better satisfaction. One reason for this lies in the fact that the Independents listen to popular sentiment; they build toll lines where they are wanted, and where they will be used to the largest extent. The Bell, on the other hand, builds toll lines only to suit its own convenience, and without any regard to the demands of the telephone using public. In long distance lines connecting the great cities, and running hundreds of miles through the country, the Independents, unfortunately, are still weak. Wonderful strides have been and are now being taken, however, to rectify this deficiency. In a very short time, the Bell long distance lines will not rival the Independents, but on the contrary will gradually fall behind, just as has been the case in the number of exchanges operated and the extent of toll line connections.

In this connection, the articles by Mr. J. W. Lattig on "Pole Line Construction" now running in *THE AMERICAN TELEPHONE JOURNAL*, should be closely followed and read by all who have anything to do with toll or long distance construction. The specifications which are being published cover the very latest and best standard of pole line construction, and are used by a large and successful Independent company. It is recognized that standard and good construction is absolutely essential to the success of any telephone line, whether long or short distance. In the past, the Independent companies have, through lack of proper knowledge, made the costly mistake of poor construction. The whole business of telephoning is peculiar; knowledge of it can only be gained by experience. Independents who have had any experience, as most of us nowadays have had, realize that the best is by far the most economical in the end. Those who have had the experience are now doing all construction according to standardized methods and the rules of the best practice. But it is a growing business, and every day new capital and new men are coming in. They have not had the experience and do not realize that the best construction is essential. We heartily recommend Mr. Lattig's articles to the most earnest attention of such.

FOREIGN OPPORTUNITIES

AMERICAN manufacturers of telephonic material are respectfully referred to the columns of "Foreign Currents" this week. Here will be found details concerning a new telephone system to be established in Durban, South Africa. Bids for materials for this plant have been advertised in the London electric journals. Owing to the fact that only one month has been allowed for the submission of bids and the many conditions imposed on competing manufacturers which require a representative to be in London to deposit a bond in order to secure a copy of the specifications, it is very difficult for American manufacturers to compete for furnishing apparatus for this system.

Just as American manufacturers of all kinds of merchandise are now recognized to be greatly superior to foreign manufacturers, so are the Independent telephone manufacturers and supply dealers now coming to be recognized in the foreign field. It is

conceded that America is the ideal telephone territory—made possible in a large degree by the superior materials of its manufacturers.

The plants of manufacturers of Independent telephone material are kept busy filling domestic orders. But why not enlarge these plants? Why not reach out for the foreign telephone business? Europeans, and every foreign people in fact, want good telephone service, just as do the inhabitants of America. They can secure the best by getting the best apparatus and supplies. The American manufacturer is conceded to have the best. There is a great field in foreign territory for American telephones and apparatus, and the wise manufacturer will note this.

IGNORANCE OF TELEPHONE USERS

WITHIN the last five or six years, the general public, the telephone using public, has had a great deal of education on the use of the telephone. In the columns of *THE AMERICAN TELEPHONE JOURNAL*, *The Listening-Key* has very clearly pointed out the advantages of teaching subscribers to economically use their instruments, and he has shown the advantage and necessity of this. That it redounds to the benefit, not only of the one subscriber who answers quickly, cuts his communication short, and gets a number in the proper way, but to every other subscriber in the system, has been demonstrated.

The one particular thorn in the side of the telephone public, is "busy." They cannot understand this. To put it plainly, they believe when the operator tells them a line is "busy," that she is not telling the truth. Not long ago, we heard a telephone subscriber in a large city make this remark. "I wanted to talk to a friend this afternoon, and called him up by telephone. The central operator told me 'busy.' I waited several minutes, then called again, and got the number. I asked my friend if anyone had been using his telephone, and jokingly suggested that he should have another instrument installed. In answer he told me that no one had used the telephone for the last half hour. That girl was talking to some fellow, and didn't want to take the trouble to give the number when I first called. The line was not busy at all."

To a telephone man who understands the conditions in a large exchange, this sounds ridiculous. The number the man wanted was a large business place. The proprietor allows his customers the free use of his telephone. Beyond doubt, at the time the call was made, a customer was using that particular telephone and the proprietor hadn't noticed the fact or had forgotten it.

It would do the average telephone subscriber a world of good to make a visit of inspection to some large exchange. He could then see for himself the strict discipline that prevails, each operator in position at the board and with calls coming in at a bewildering rate; the watchful monitors pacing the floors watching for the slightest breach of discipline; the chief operator supervising each girl's work and seeing that they expeditiously answer all calls and properly, and that the subscribers receive proper treatment. He would see that a telephone operator has no time or opportunity, even were she so inclined, to talk with friends either outside or inside the building. If every telephone subscriber had such an opportunity of inspecting the inside workings of a large exchange, there would be no kicking about lines being "busy."

On the contrary, each subscriber would then seek to keep his lines from being "busy" as far as was possible, and if they were used to such an extent that they were constantly "busy," if he were wise, he would have other telephones installed and probably a private branch exchange. He would also learn to hear and understand the "busy" signal, and hang up his receiver without waiting for the operator to report.

FOREIGN CURRENTS.

AS an example of the opportunities for telephone manufacturers that are arising in South Africa we note that the Corporation of Durban, Natal, is advertising in the London electric journals for equipment for the proposed municipal telephone system. The plant required is divided into two portions and tenders are requested under two separate contracts, as follows: Contract No. 1.—A complete exchange equipment for an ultimate capacity of 7,200 lines, the present contract to make immediate provision for 2,520 lines. The equipment is to comprise all distribution and switch-room boards, power plant and wiring. The contract is also to include the work of erection at Durban, and maintenance for three months. Contract No. 2 is for cable and is to cover underground dry-core air-space cables, comprising, approximately:

15,000 feet.....	200-pair
12,000 ".....	150- "
25,000 ".....	100- "
6,000 ".....	75- "
7,000 ".....	50- "
12,000 ".....	25- "

about fourteen miles of cable in all, not a very large underground system. Tenders may be submitted for either or both contracts, but the corporation does not bind itself to accept the lowest or any tender. Unfortunately American manufacturers unless they have agents in London cannot compete for this particular installation, as tenders must be delivered to Messrs. Webster, Steel & Co., agents to the Durban Corporation, 5 East India avenue, Leadenhall street, London, E. C., on or before Friday, December 5, 1902.

* * *

It is possible that these lines may not reach the eyes of members of South African town councils or their agents, but we would respectfully point out that if they want up-to-date telephone equipment America is the place to get it, and they cannot get American telephone equipment if they advertise for tenders only in English journals and allow only a month for tenders to be sent in. In this case the usual English practice of obtaining quotations for supplies is followed by announcing that tenders are wanted for certain materials to be made according to certain specifications. The specifications can be obtained from the agents in consideration of a deposit of five guineas (about \$25), the deposit being returned on receipt of a *bona-fide* tender and the return of all documents. This method ensures a fair competition and makes it certain that all bidders are estimating on precisely the same thing. The exaction of a deposit of \$25 for a copy of the specifications keeps out the small fry who would like to estimate on everything, but never put in any serious estimates on anything. The weak point is that the short time allowed for sending in tenders prevents manufacturers in this country, who are the best situated for providing the most improved plant, from competing for the work.

* * *

The radiophone experiments in Germany of Dr. Ernst Ruhmer are still attracting a good deal of notice from the foreign electrical papers, and articles descriptive of the experiments continue to be published under the title of "wireless telephony." According to the latest accounts, the experiments of Dr. Ruhmer, like the more famous demonstrations of Mr. Marconi, were one-way only; that is, with a single transmitter and a single receiver. It seems that about four and a half miles was the best distance obtained, but transmission in all cases was good, and in the last experiment "surprisingly loud and clear" so Dr. Ruhmer hopes still to increase the range of his transmission. From a letter of Dr. Ruhmer's in the London *Electrician* it appears that Mr. Th. Simon, another German experimenter, has been claiming priority in adapting the speaking arc to "wireless telephony" without having known of the experiments of Graham Bell. Dr. Ruhmer says "without doubt Graham Bell first applied the speaking arc for photophony in 1899." As a matter of fact Professor Bell's first experiments with what he called the "radiophone" were made more than ten years prior to the date given by Dr. Ruhmer. These experiments were made not with an arc light, but with a reflected

ray of the ordinary sunlight of everyday life. The "speaking arc" was first publicly exhibited in this country at the Electrical Exhibition held at Madison Square Garden, in May, 1898. At that exhibition many persons heard speech transmitted along a beam of light across the arena, and the installation was fully described in the technical journals. So why Messrs. Simon and Ruhmer should have got their dates so inaccurate is a little difficult to understand. Presumably the American technical journals reach Germany.

* * *

While on the "wireless" question note may be made of an article in the *Electrician* which effectually disposes of Mr. Marconi's claim to have rendered his system of wireless telegraphy free from overhearing or interference. The *Electrician* recently published a report by Lieutenant Solari of the voyage of the *Carlo Alberto* from England to Italy, during which messages were received at intervals from the Marconi station at Poldhu, Cornwall. The *Electrician*, in an editorial note in the same issue, said that it had information that the signals at Poldhu were read at several non-Marconi wireless stations in England. This brought an indignant denial from the London manager of the Marconi Company. Now appears an article by McNevil Maskelyne, who has been in charge of a wireless station equipped by the Eastern Telegraph Company at Porthcurnow, Cornwall, not many miles from the Marconi station at Poldhu. At the Porthcurnow station Mr. Maskelyne received all of Poldhu's messages directed to the *Carlo Alberto*; and he very unkindly points out that he received one famous message, conveying the "humblest homages" of the Italian Embassy in London to the King of Italy, three days before it was received on the *Carlo Alberto*. This message was first sent on September 6th and according to Lieutenant Solari's report it was first read on the *Carlo Alberto* on September 9th. It was repeated, of course, many times, presumably until the *Carlo Alberto* acknowledged receipt by the more prosaic if reliable wires and cables of the regular telegraph system.

* * *

From Mr. Maskelyne's article it seems clear that the powerful currents sent out from Poldhu in the endeavor to keep up communication with the Italian cruiser would affect any wireless receiving apparatus within a large radius. And it also seems clear that the problem of syntonizing or tuning the currents so as to make them selective has not yet been solved. Mr. Maskelyne's receiving tape, of which he prints many specimens, show that in order to prevent overhearing by nearby instruments, the Poldhu station at times sent out a series of dots from another apparatus simultaneously with the transmission of the message by the main apparatus, the idea being that the succession of dots would superimpose themselves on the signals and jumble the record at a station comparatively near, but would not reach out far enough to interfere with the reception of the main signals by a distant receiver. If this is to be the method adopted for rendering secret wireless transmission to long distances one naturally wonders what will be the effect on the really useful wireless communication between ship and shore. And where will the poor little sensitive wireless telephone come in if the ether is to be dominated by these powerful aerial trolley currents? It looks as if the telephone would still have to stick to metallic circuits.

* * *

The latest development in municipal telephony in England is that the first corporation to take up competitive telephony, that of Tunbridge Wells, after about two years of active competition is about to retire from the telephone business and sell out to the National Telephone Company. The published reports of the progress of the Tunbridge Wells system show that \$125,000 has been spent on a system serving 853 stations, an average cost of nearly \$140 per station. More capital is needed to extend the system, according to the telephone managers report, which also shows that the financial results so far have given a loss of just \$95, instead of the profit that was expected. Some of the rates adopted have proved unremunerative, and in spite of the low rates adopted and the strong competition of the municipal system, the National Company's system has kept in the lead, having 1,015 stations to the Corporation's 853. Consequently the municipal

officials feel that they have gone far enough with the telephone business and propose to hand over the whole system to the National Telephone Company in consideration of the reimbursement of the capital spent and an agreement not to raise the rates for service beyond certain specified figures. This proposal has aroused considerable opposition from those who favor the municipal system and further meetings are to be held before the matter is definitely decided.

This is but another illustration of the fact that departmental methods do not suit the telephone business. There is something peculiar about the supply of telephone service that prevents the industry from flourishing under any but the most purely commercial management. Municipal administration is not so wholly uncommercial as government but it is bureaucratic on a smaller scale, and the telephone simply cannot stand it.

The Arrester.

POLE LINE CONSTRUCTION

ARTICLE II.—SPECIFICATIONS FOR CONSTRUCTION

By J. W. LATTIG

IN a previous article it was pointed out that poor construction of pole lines is much indulged in by Independent telephone companies. It was also stated that this was a great mistake. In nearly every instance such lines are rebuilt. A complete specification, giving a general description of a standard 35-foot pole line and the materials to be used in its construction, was given.

The specifications given below go into the minutest details of the construction of a 35-foot pole line, according to standard practice, as used by the United Telephone and Telegraph Company:

TESTS.—All tests to be made with apparatus satisfactory to this company.

PACKING FOR SHIPMENT.—Each coil shall be securely bound with at least four pieces of strong twine, and then so protected by wrappings of burlap that there will be no damage from mechanical injury in transportation. The diameter of the eye of the coil shall not be under 20 inches, nor more than 22 inches.

WEIGHT.—Each coil is to have its weight and corresponding length plainly and indelibly marked upon two strong tags, one of

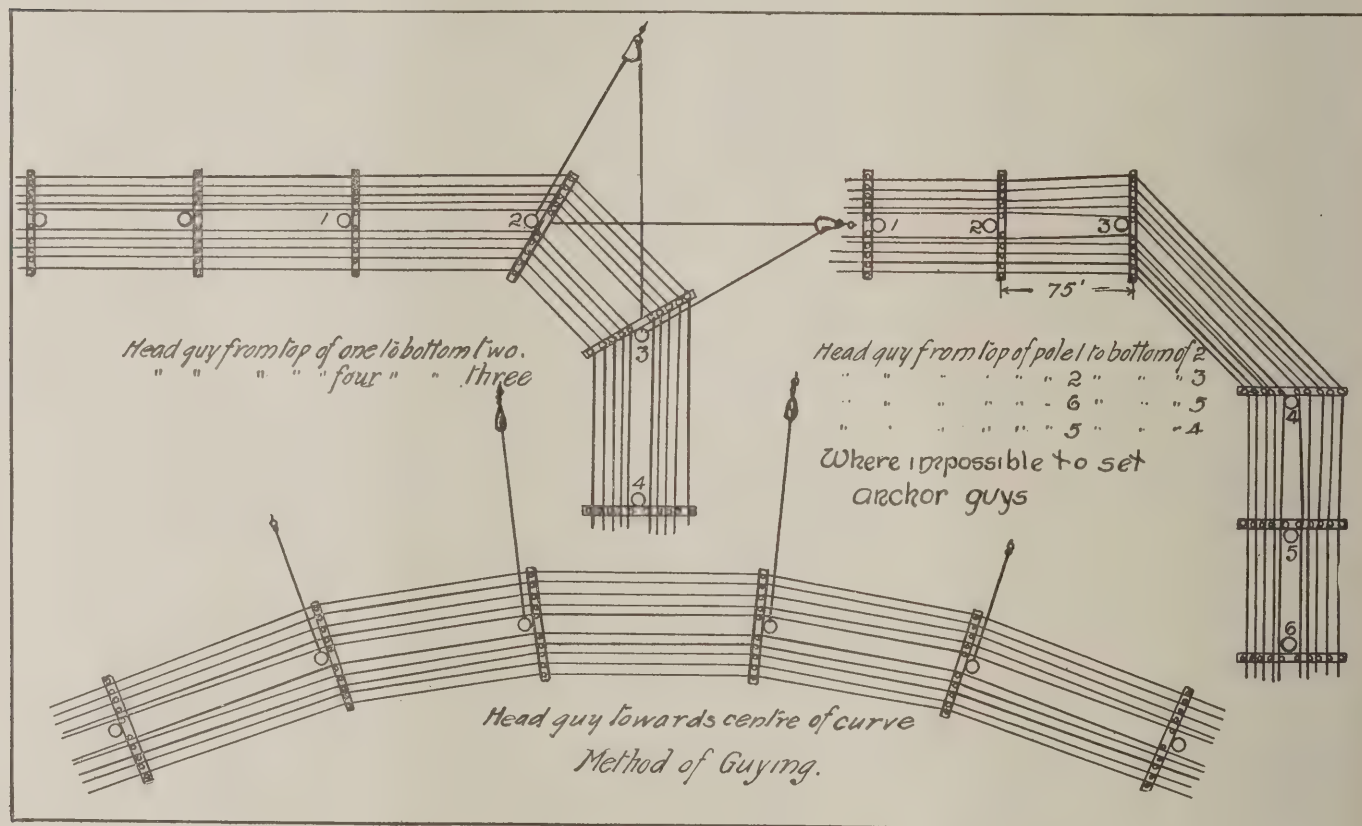


FIG. 20.

FIG. 21.

FIG. 24.

BOLTS FOR GUYING TO ROCK.—The bolts shall be of style and dimensions shown in Fig. 19, and shall be of commercial wrought iron well galvanized.

STAPLES.—All staples shall be of No. 6 B. W. G. galvanized steel wire. They shall be $2\frac{1}{8}$ inches long and style and dimensions as shown in Fig. 16.

LINE WIRE.—All line wire shall be hard-drawn copper and conform to the following specifications:

Finish.—Each coil shall be drawn in one continuous length free from factory joints. The wire to be cylindrical, free from scales, flaws, splints, and other imperfections.

INSPECTION.—An inspector appointed by this company shall have the privilege of testing each coil and may cut out any part. He shall also have the privilege of overseeing, cutting and packing of samples, and of being present during manufacture of the wire.

EDITOR'S NOTE.—Mr. Lattig's first article appeared last week. Others will follow.

such tags being attached to coil inside and the other outside of burlap.

MECHANICAL AND ELECTRICAL REQUIREMENTS OF GUY ROPE.—All guy rope shall be of seven-strand steel and conform to specifications, which are as follows:

SEVEN-STRAND GUY ROPE.—1. *Diameter of Strand.*—Each strand of the guy rope shall be made of No. 12 B. W. G. steel wire.

2. *Finish.*—The wire shall be cylindrical and free from scales, inequalities, flaws, sand, splints, and all other imperfections and defects.

3. *Mechanical Properties.*—The wire shall be capable of elongating 4 per cent. without breaking. When clamped in vices 6 inches apart the wire shall stand fifteen twists without breaking. The wire when tested by direct applianee of weight shall not break when subjected to a strain of at least 4 8-10 times its weight in pounds per mile.

4. *Laying of Guy Rope*—The seven strands shall be laid up with a right-hand lay, not exceeding $3\frac{1}{2}$ inches in length.

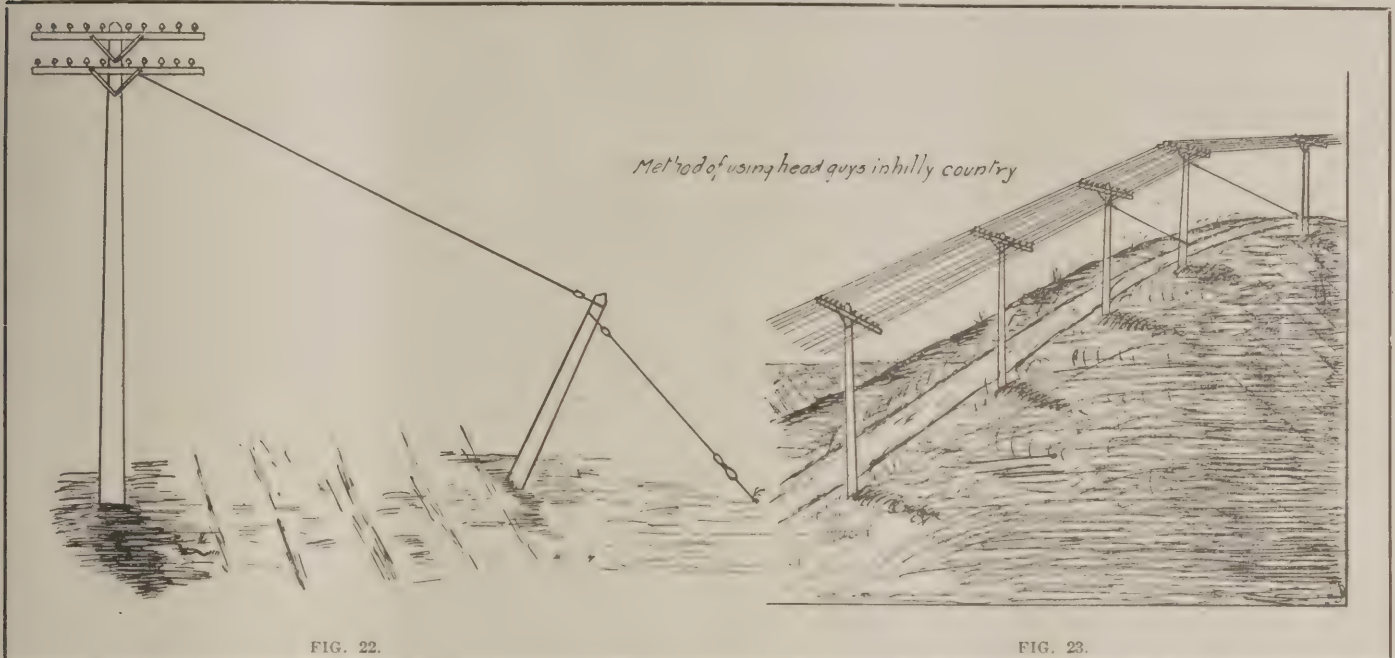
5. *Galvanizing*—The guy ropes shall be well galvanized and capable of standing tests hereinafter mentioned.

6. *Size of Coil*—The rope shall be furnished in coils of such length as to weigh between 140 and 160 pounds.

IRON WIRE.—All iron wire shall be of extra B. B. galvanized.

TIE WIRE.—Tie wire shall be of soft copper of the same size as line wire. For No. 12 B. & S., they shall be 19 inches in length; for No. 10 B. & S., they shall be 20 in length, and No. 8 B. & S., they shall be 24 inches in length.

with other poles. Locate poles in a straight line, deflections of less than 90 degrees shall be made on one pole, and this pole shall be securely head-guyed. On all turns of 90 degrees the turn shall be made on two poles, and each of said poles double head-guyed as shown in Fig. 20. On all curves, as many poles as may be necessary shall be used to properly support 40 wires (Fig. 21). In building line on railroad rights of way, no pole shall be set at distance of less than 12 feet from the edge of nearest rail, unless the lowest cross-arm on pole is higher than 25 feet from the top of rail. If cross-arm is higher than 25 feet from top of rail, the pole may be set not less than 7 feet from the rail. In building

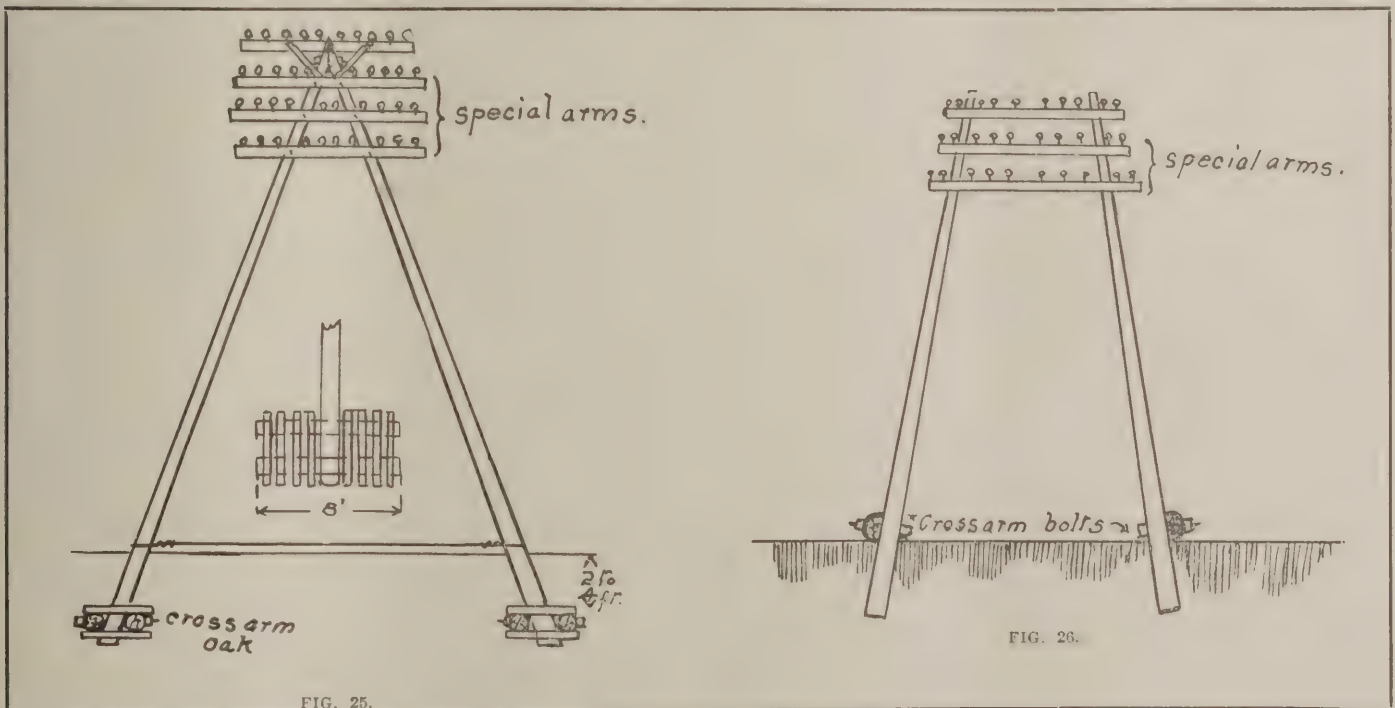


SLEEVES.—All joints in line wire shall be made with McIntire sleeves.

GALVANIZING.—All parts galvanized shall be capable of standing the following tests: The sample shall be immersed in a saturated solution of copper sulphate for one minute, and then

a line in a city, locate poles on corners of intersecting streets, where possible, so as to permit of side guying.

CLEARING OBSTACLES.—To clear obstacles, poles of such length shall be used as will allow the wires on four cross-arms to be at least 4 feet from the obstacle, unless impossible.



wiped dry. This process shall be repeated three times. If, after the fourth immersion, there shall be a copper deposit, or the galvanizing be removed, then the lot shall be rejected.

LOCATING LINES.—In locating lines, measure off and place stakes at equal distances of 130 feet without regard to obstacles. Then locate pole as near to stake as possible, not getting it out of line

DISTRIBUTION OF POLES.—In distributing poles, the heaviest poles shall be placed on corners. The straightest and best looking poles shall be distributed through cities and towns and in front of residences.

LEVELING.—The length of poles shall be proportioned to the contour of the country, so that the wires may be strung without abrupt changes in the level.



New Companies

EVANSVILLE, IND.—Nearly \$70,000 worth of stock has been subscribed by citizens towards defraying the cost of the local telephone company, and it now seems an assured success. The promoters expect to have \$125,000 subscribed in a short time, and when that amount is secured, a contract will be given to a construction company. It is expected that work will be begun in the early spring, and just as soon as the plant is completed, the Cumberland Company will be forced out of the city.

HIAWATHA, KAN.—Hiawatha men are contemplating another telephone exchange, which will be run by the people on the co-operative plan.

PORTLAND, ME.—The Boston Telephone Selector Company has been incorporated, with a capital stock of \$500,000. J. F. Fanning is president and A. C. Percy treasurer, both of Portland.

GRAND RAPIDS, MICH.—Articles of incorporation have been filed here with the register of deeds of the Bidwell Trolley Car Telephone Syndicate. The capital is \$3,000,000 and the organization is under the limited act. John J. Ludwick is chairman; Benson Bidwell, treasurer and Charles F. Bacon secretary. The object is to protect the patentees of the Bidwell trolleys and car telephones from infringement of their rights.

MINNEISKA, MINN.—A local telephone company has been organized here. M. A. Callahan, Aug. Drenkhahn and John Peshon are local instigators. Connections are to be had with Beaver, Weaver, Trout Valley and Kellogg.

BENNETT, NEB.—The Bennett Telephone Company has been incorporated with a capital stock of \$10,000. Incorporators: G. W. Eggleston, A. L. Berghol and E. A. Vanderlip.

BERTRAND, NEB.—A movement is on foot for the establishment of an independent telephone line between Bertrand and Holdrege, giving patrons direct connections from their offices or places of business with the county seat.

ELGIN, NEB.—The Antique County Mutual Telephone Company has been organized here.

HASTINGS, NEB.—The Adams County Telephone Company, with headquarters at Hastings, has been incorporated with a capital stock of \$30,000. Incorporators: Jacob Bernhardt, John N. Lyman, A. L. Clarke, W. H. Ferguson, G. J. Evans, C. W. Stewart and W. H. Lanning.

EAST CHATHAM, N. Y.—The Frisbie Street Line Telephone Company, organized to operate telephone lines in Columbia County, has been incorporated, with a capital stock of \$350. The directors are: E. P. Jenkins, F. S. Hall, E. N. Cady, A. Lape, R. H. Girdler, A. Stump and H. H. Park, all of East Chatham.

THERESA, N. Y.—The Theresa Telephone Exchange Company has been incorporated with a capital stock of \$2,000. Directors: F. S. Rodenhurst, G. P. Schwarz and J. W. Wakefield, of Theresa.

TROY, N. Y.—The Commercial Union Telephone Company has been incorporated with a capital stock of \$10,000. The directors are John T. Christie, Wm. C. Geer, Cornelius V. Collins, Wm. Conners, Stephen C. Medbery, Peter McCarthy, Wm. D. Mahoney, James H. Cladwell, of Troy, and W. L. Burk, of Glens Falls. The company's object is the consolidation of many independent lines in the State, and also the construction and operation of new exchanges.

SKANEATELES, N. Y.—George M. Tallcot is endeavoring to form a farmers' telephone company, with an exchange here. His plan is to run lines from this town to Borodino, Navarino, Marcellus, Elbridge, Sennett, Owasco, Mandana and Auburn.

CLARINGTON, O.—The Clarington Home Telephone Company has been organized by James Steiger, H. M. Smith, Albert Deitrich, W. T. Powell and J. A. Hyer.

WESTON, O.—The Weston Home Telephone Company has been incorporated with a capital stock of \$10,000. Incorporators: Isaac N. Neifer, Samuel A. Murphy, A. T. Munn, Thos. J. Pugh, George I. Dewese, Isaiah B. Ballmer.

ELRENO, OKLA.—The Topeka and Elreno Telephone Company, of

Elreno, has been incorporated with a capital stock of \$100,000. Incorporators: W. F. Evans, of Topeka, Kan.; F. H. Wright & Co., of Elreno; Henry B. Johnston, of Chickasha, I. T., and Wm. M. Grimes of Guthrie.

CASTLEROCK, WASH.—The Castlerock and St. Helens Telephone and Telegraph Company has been incorporated with a capital stock of \$5,000.

FOOTVILLE, WIS.—The Footville Telephone Company is now an assured fact. Corporation papers are being made out and the work is well under way. Several miles of holes have been dug, a carload of poles has been ordered and also a supply of wire, cross arms, braces, etc. There is still a limited amount of stock to sell.

Financial

ELLIOTT, ILL.—The Dix Telephone Company, of Elliott, has filed amended articles of incorporation increasing its capital stock from \$5,000 to \$6,000.

NEWTON, ILL.—The Jasper County Mutual Telephone Company, of this place, has increased its capital stock from \$5,000 to \$10,000.

CORNING, IA.—The Corning Telephone Company has increased its capital stock from \$15,000 to \$25,000.

BOSTON, MASS.—The Cumberland Telephone and Telegraph Company reports for the two months ended Oct. 31 as follows:

	1902.	1901.	Inc.
Number of subscribers.....	85,356	71,887	13,469
Gross receipts.....	\$524,472	\$464,854	\$59,617
Expenses and charges.....	378,671	336,154	42,517
Surplus	145,800	128,700	17,100

HOLMES CITY, MINN.—The Interurban Telephone Exchange Company of Holmes City has filed with the Secretary of State an amendment to its articles of incorporation, increasing its capital stock from \$10,000 to \$100,000, and its limit of indebtedness from \$1,500 to two-thirds of the amount of the capital stock subscribed.

CENTERVILLE, MO.—The Reynolds County Telephone Company, of Centerville, has filed articles showing that it has increased its capital stock from \$1,000 to \$2,000.

BLACKSTONE, VA.—The Blackstone Telephone Company has applied for a new charter, changing its name to the Southside Telephone Company, and raising the capital from \$5,000 to \$250,000. It is extending the lines to Crewe and Nottoway Courthouse, and expect to go into Lunenburg and Brunswick counties.

Elections

ALLEGAN, MICH.—The West Michigan Telephone Company, which was incorporated a little more than a year ago, recently held its first annual meeting of stockholders and made no change in the management. M. D. Owen, of Allegan, is president and general manager. Silas Loew, of Bur-nip's Corners, is vice-president, and David Cornwell will be the secretary and treasurer.

BLOOMFIELD, O.—The Bloomfield Telephone Company held an election for officers recently, and the following were chosen: President, E. O. Lucas; vice-president, James Willemin; secretary, A. P. Hammond; treasurer, Peter Hoobler; directors, F. M. Blackburn, Wm. M. Cope, C. W. Cookson, C. A. Jones, J. L. Mather.

MASILLON, OHIO.—The stockholders of the Masillon Telephone Company held their annual meeting recently. The officers of the Federal Telephone Company were also present. It was decided to at once spend \$10,000 in stringing new cables and increasing the capacity and efficiency of the exchange. Directors were elected as follows: O. C. Volkmor, H. A. Croxton, J. C. F. Putnam, J. B. Hoge, J. H. Hunt, F. S. Dickson, Maxime Reber, R. W. Judd and W. S. Cory. The officers will be elected in the near future.

SALIX, PA.—At the annual meeting of the stockholders of the Salix Telephone company held in Scalp Level the following board of directors was

THE WEEK'S MESSAGES Continued.

elected: A. F. John, George W. Swank, William R. Foster, Charles Glock and M. P. Boyle, of Johnstown; Dr. Hclsel, R. S. Shaffer, Abraham Hostetler and Norman Weaver, of Scalp Level. Following their election the members of the board elected the following officers: R. D. Shaffer, president; M. P. Boyle, vice-president; Norman Weaver, secretary and treasurer.

Franchises

MILLEDGEVILLE, GA.—The city council has granted a franchise to the Milledgeville Telephone Company to construct and operate a telephone system here.

SHAKOPEE, MINN.—The city council has granted a ten-year franchise to the Minnesota Valley Telephone and Telegraph Company, to construct and operate a telephone system in this city.

ST. PAUL, MINN.—The Twin City Telephone Company has been given permission to string additional wires and cables in the city.

HELENA, MONT.—Dr. Emil Dorn, of Chicago, has asked the city council for a franchise to construct and operate a system here. If a franchise is granted, he says the system will be completed within a month.

LIMA, N. Y.—The Independent Union Telephone Company has been granted permission to put its line through Lima under certain conditions, one of which is that within four months a toll office shall be established in the village.

PULASKI, N. Y.—The Black River Telephone Company has been granted a franchise by the city trustees to erect poles and run wires through the streets. It is understood that the company proposes to erect an exchange here and furnish good service at a lower rate than is given by the Bell. It has plans for a good many toll and farmer lines, some of which are now under way that will give service to all neighboring towns and villages.

WILLIAMSVILLE, N. Y.—The village trustees have granted the Frontier Telephone Company a franchise to do business in this place.

CARROLLTON, O.—The city council has granted a franchise to the Scroggsfield Telephone and Telegraph Company to construct and operate a telephone system in the city.

DAYTON, OHIO.—The Home Telephone Company has been granted a franchise to erect poles along the canal, subject to an agreement between the Miami and Erie Traction Company and the Home Company.

HULMEVILLE, PA.—A special meeting of Hulmeville Borough Council was held recently to consider the application of the Keystone State Telephone and Telegraph Company for right of way for a line through the borough. F. A. Wunder, general agent, and H. Hibbett, agent of the company, were present. A draft of an ordinance was submitted to council for consideration. After discussion the title of the ordinance was read and referred to the Borough Attorney to be drafted on similar conditions as the ordinance gives the Delaware and Atlantic Telephone Company. Mr. Wunder agreed to accept a similar ordinance on behalf of his company and also pay the poll tax of 50 cents on each pole for the present year and in each succeeding year.

TUNKHANNOCK, PA.—The Tunkhannock and Wyoming Valley Telephone Company of Centremoreland has asked for a franchise to construct a system here. It will also increase its capital stock from \$2,000 to \$30,000.

PALMYRA, PA.—The Eastern Telegraph and Telephone Company has applied to the township committee for permission to construct and operate a telephone system in the township.

MARLIN TEX.—A franchise has been granted by the city council to the Falls County Telephone Company to construct a system in this city.

MONROE, WIS.—The United Telephone Company of this city has asked the Stephenson County Board of Supervisors permission to run a line to Orangeville. The communication was referred to the committee on roads and bridges, but undoubtedly will be favorably acted upon.

Combinations

HARTSVILLE, IND.—The Hartsville Telephone Company has sold its plant to Cotelle & Clap Brothers.

POCOMOKE, MD.—The telephone line of the Peninsula Telephone Company will be sold at public auction by Ben T. Gunter, trustee, at Kellar Station, Va., on Tuesday, Dec. 2.

CANASERAGA, N. Y.—The Garwoods and Canaseraga Telephone Company has sold its right, title and interest in the telephone line between the two places to Henry L. Root of Garwoods, who will make repairs on the line and again put it in running order.

APOLLO, PA.—The recently incorporated Apollo Telephone Company has purchased all the equipment, poles, lines and telephones, franchises and

rights of Messrs. Bollinger and Walker in the local telephone exchange and assumed control. The company will at once take up the matter of extending lines and acquiring connections with new territory, adding very effectually to the service. C. W. Bollinger remains general superintendent of the new company and will have charge of the office and business.

STROUDSBURG, PA.—John S. Schoonover has purchased almost the entire stock of the Monroe County Telephone Company, which includes the Effort and McMichaels, the Citizens and the line from Tannersville and Mt. Pocono lines. These all connect with the Stroudsburg and Bushkill Company. It is proposed to make the S. & B. telephone service a most complete one by next spring. Cables will be run, metallic circuits installed and copper wire used. At a meeting of the Monroe County Telephone Company the resignation of several directors were accepted and Mr. Schoonover, Ben D. Hursh, Henry Smoyer, C. B. Staples, W. A. Erdman and Ed. Peters elected to the vacancies. An organization was effected by electing Mr. Schoonover president; W. A. Erdman, secretary, and Ed. Peters, treasurer. Much money is to be expended in making the telephone service more up-to-date. Copper wire, sufficient to run a metallic circuit between Stroudsburg, Mt. Pocono, Tobyhanna and other points on the mountain via Tannersville, is to be put up, and a number of instruments installed in that section.

Construction

PINE BLUFF, ARK.—George W. Buchanan, manager of the Independent telephone company here, says the system is increasing at such a rapid rate that the present switchboard will be full within a few months. He says the company will then make arrangements for increasing its facilities so as to handle the large influx of subscribers.

CUTHBERT, GA.—The Cuthbert Telephone Exchange is building a long distance line from this city to Arlington, via Grubb, Moye, Bells and Edison. This will make the fourth long-distance line owned, the others being to Dawson, Benevolence and Spring Vale. Besides the local exchange in Cuthbert, it also owns the one in Shellman. F. H. Davis is the owner.

LEONORE, ILL.—The Leonore Telephone Company has decided to purchase a new switchboard for its exchange here.

LEROY, ILL.—T. L. Parks, the new owner of the Leroy Telephone Company, is making arrangements for the extension and improvements of the service.

MANHATTAN, ILL.—The Manhattan Telephone Company is constructing a new line to Deselm and another from Wilton Center into Kankakee County. It is the intention to install an exchange at Deselm and construct many new lines throughout Kankakee County.

KOKOMA, IND.—P. O. Hile, of Shanghai, was in the city recently in the interest of the Burlington, Shanghai and New London Farmers' Telephone Company. This company, which is using the Kokomo instruments, has about 75 subscribers. The owners expect to extend their lines to Russiaville, Middle Fork and West Middleton, and become an attaché of either the Kokomo Independent line or the line at Frankfort, whichever place gives them admission on the most reasonable terms.

MONTMORENCI, IND.—Superintendent Williamson, of the Montmorenci Telephone Company, will extend the line north in a short time.

DES MOINES, IA.—The Hawkeye Telephone Company is stringing 800 miles of copper wire circuit from this city to surrounding towns on four different routes. Of this line, 400 miles is to be used by the Hawkeye company. The other 400 miles will be leased by the Weare Commission Company and is being constructed for that concern. The latter will be independent service, serving offices which the Weare company will open in twenty-four towns surrounding Des Moines. It will be a direct line from those towns into the Des Moines office of the concern. The Hawkeye company secured the contract for the construction of this 400 mile line before fully determining upon its own plant tapping the twenty-four towns referred to. The Hawkeye line will be in connection with the Mutual Telephone Company of Des Moines and all of the other Independent toll lines of the State. The 800 miles of new wire will be stretched on the following routes: From Des Moines to Indianola, Winterset, Bevington, Patterson, Carlisle and Summerset. From Des Moines to Booneville, Van Meter, De Soto, Earlham, Dexter and Stuart. From Des Moines to Waukee, Adel, Redfield, Linden, Panora and Guthrie Center. From Des Moines to Dallas Center, Minburn, Perry, Bouton and Woodward.

IOWA FALLS, IA.—The Central Telephone Company, which has its headquarters in this city, is rapidly carrying out a plan whereby a network of rural telephone lines will ultimately cover Hardin, Franklin and Wright counties. The company already maintains toll lines running to Eagle Grove, Hampton and this city and with exchanges in this city offers good service, but each of these exchanges are to be connected with rural telephone lines running to all parts of the above counties. The exchange here is headquarters for twelve telephone lines running in every direction and with about 200 telephones on the rural lines.

THE WEEK'S MESSAGES *Concluded*

LINCOLN, IA.—The Lincoln Farmers' Telephone Company will construct a line to Eagle Center in the near future.

REMSSEN, IA.—J. H. Quick and H. J. Miller of Sioux City will build a telephone exchange in Remsen.

WESTBROOK, ME.—The Westbrook Telephone Company will begin the construction of its line in the early spring.

JACKSON, MICH.—N. F. Wing, manager of the Jackson Farmers' Telephone Company, is constructing a line from here to Grass Lake, where he now has his residence.

CROOKSTON, MINN.—The Iron Range Electric Telephone Company will install a central energy switchboard with a capacity of 1,000 lines next spring.

NEBRASKA, NEB.—The business of the Nebraska City Telephone Company at its Syracuse exchange has increased to such an extent, under the management of Charles Bennett, that it is necessary to put in an additional switchboard.

BRANCHVILLE, N. Y.—It is reported that the Farmers' Telephone Company of Sussex, may possibly extend its line to Branchville from Beemerville in the near future.

TREWSBURG, N. Y.—The Home Telephone Company, of Trewsburg, recently incorporated, has its system completed, and in working order. It is connected with the Home Telephone Company of Jamesburg. The company expects to extend its lines up Frew Run this fall with a branch over Oak Hill in that vicinity, and will in time carry its service to every part of the town of Carroll and some points in adjoining towns. A line will also be built to Fentonville and probably farther down the Conewango Valley. The officers of the company are: President, G. R. Raynor; secretary, treasurer and general manager, E. W. Scowden.

GROTON, N. Y.—The Miller Farm and Village Telephone Company is constructing a telephone exchange system in this town.

LE ROY, N. Y.—The Inter-Ocean Telephone Company is securing rights for placing its poles in that village. It is expected that the company, which was granted a franchise a few weeks ago, will soon begin the work of construction.

TOWER CITY, N. DAK.—Priewe and Dalrymple of Casselton are constructing a telephone exchange at Tower City for the Tower City Telephone Company.

ALLIANCE, O.—At the conference recently of the officers of the Federal Alliance Company, with the directors of the Stark County Telephone Company, plans were gone over for the increase of the city and county service of the company. Manager A. S. Hillhouse said that the \$100,000 which is to be at the disposal of the Canton exchange, the extension of the work at Alliance and the development of rural lines will be forthcoming after Dec. 1. Among the things authorized are 1,000 additional telephones of the local exchange, besides the establishment of branch exchanges in villages of the county. New cables and pole lines will be put up. Plans and specifications for the new improvements are now being made in Cleveland.

CHESTER, PA.—The United Telephone and Telegraph Company will soon put all its wires here underground, and also install a central energy switchboard.

LE RAYSVILLE, PA.—Dr. F. W. Rice of Rome was in town recently attending to the preliminary work to construct an Independent telephone line from this place to Allis Hollow. The line from Rome, which has connection with the Bradford County people, has wire up to Allis Hollow. The doctor states that the line at Allis Hollow will be immediately extended to Herrickville and from there to Rummerfield.

READING, PA.—The Consolidated Telephone Company has a gang of about 90 men at work at Boyertown on the line of that place. The work is being rushed as rapidly as possible. Another gang of men from Scranton are working on the Hamburg extension. All the suburban lines are being pushed as rapidly as possible.

Miscellaneous.

WICHITA, KAN.—The Wichita Telephone Company has connected its toll lines with the lines of the Butler County Independent Telephone Company. As fast as possible, its lines will be connected with Independent lines throughout the State.

ALBANY, ILL.—The Albany farmers' telephone line has been connected with the Tri-City telephone line at Albany. This gives the patrons of the Albany line free communications with Clinton and Lyons. A toll is charged for connections made with all patrons on the Tri-City or White-side Harrison lines in Illinois.

FREMONT, NEB.—Vice-President Clark, of the Nebraska Independent Telephone Association, was here recently. Mr. Clark is the moving force also, in the Sarpy County Independent Telephone Company. He came to Fremont to confer with the officers of the Fremont Telephone Company with reference to connecting with his lines. His company has connection with Valley and has a wire to the city limits of South Omaha. Thus it

will be seen as soon as Fremont connects with Valley it will reach South Omaha.

LOUISVILLE, NEB.—Superintendent Kennedy, of the Plattsmouth Telephone Company, was here recently with a force of men repairing the central exchange and adding several new telephones to the already large number now in use here. Mr. Kennedy has charge of the entire system in the line of construction. The Plattsmouth company is doing a great deal to improve the service.

PHILADELPHIA, PA.—The Keystone Telephone Company has been incorporated under the laws of the State of Pennsylvania. The exact plans of the promoters of this company cannot be learned, but as explained by John M. Mack, one of the directors, the new corporation may acquire the rights of the original Keystone Telephone Company, a New Jersey corporation, as well as the rights of "every other corporation, firm and individual, by purchase, lease or otherwise."

PLANTS FOR SALE

Advertisements under this head \$1.00 for 25 words or less for each insertion. Prepaid.

LEASE:—Wanted to lease telephone or electric light property, by practical, all around electrical man with some capital. Address CAPITAL, care AMERICAN TELEPHONE JOURNAL, New York.

FOR SALE—One of best equipped telephone exchanges in Kansas; price, \$22,000; upon which amount plant now NETS 23 per cent. If you mean business, address X for particulars, care of AMERICAN TELEPHONE JOURNAL, New York.

WANTED

Advertisements under this head, 25 cents for 25 words or less for each insertion. Prepaid.

WANTED—Sober, reliable young man as superintendent of 200 subscriber plant and outside work. Must be thoroughly competent in switchboard and instrument work of magneto and common battery system; hustler, capable of maintaining plant to highest efficiency, and know how to get best work from employes. Address, stating experience, references and salary expected, TELEPHONE, Lock Box 93, Elizabeth City, N. C.

POSITION WANTED by strictly temperate man, 25 years old, with seven years' experience in Independent and Bell systems. Experienced in all branches of work. References from former and present employers. South preferred. Address EXPERIENCE, care AMERICAN TELEPHONE JOURNAL, New York.

MANUFACTURERS: An engineer, experienced in designing common battery apparatus, and with excellent references, desires position with a good telephone manufacturing company. Address ENGINEER, care AMERICAN TELEPHONE JOURNAL, New York.

EXCLUSIVE handling of an account, for Chicago trade, beginning January 1st. Manufacturers Agency basis. Address SALESMAN, care AMERICAN TELEPHONE JOURNAL, Monadnock Building, Chicago.

SALESMAN for general supplies for electric lighting and telephone purposes; familiarity with machinery and incandescent lamps a desirable addition; state experience, references and salary. Address F. BISSELL CO., Toledo, Ohio.

A HOME IN SOUTHERN CALIFORNIA—I desire to communicate with a man capable of taking charge of a factory for insulating rubber-covered National Code wires. This is a splendid opportunity for the right man. References given and required. No money necessary. Address P. O. BOX 1116, Los Angeles, Cal.

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THE SECOND MEETING OF THE INTER-STATE ASSOCIATION

AUDITORIUM HOTEL, Chicago. Every operator, every manufacturer and everyone engaged in the Independent telephone movement in the Middle West will, on the 9th, 10th and 11th of this month, center their interest on the group of men who will be there in convention. These men, last April formed the Inter-State Independent Telephone Association, and this will be their second meeting.

In existence less than one year, the Inter-State Association is looked on as the guiding spirit of the Independent telephone movement in the country. It is the backbone of the industry.

There are reasons—good reasons for this meeting.

The Inter-State Association represents the financial interests, the operators out in the field, and the manufacturers and dealers in Independent telephone apparatus and construction supplies. It embraces the nine states in which Independent telephony had its birth and in which lie its power and strength.

The Inter-State is representative of Independent interests in its territory because every member has a voice in its policy and its governing. There is no man or set of men who dominate or dictate its affairs. All members are recognized as being free and equal—each has a share of responsibility for the guidance of the Association and the general welfare of the movement. The small operator or manufacturer or supply dealer, has the same importance in the Inter-State as the large financial interests, whether they be operating or manufacturing. And that very fact is the keynote of the wonderful success and popularity of the organization.

The Inter-State Association was organized for mutual benefit, for the general good of the Independent movement. Its purpose was not that a clique of large financial interests, should dominate to its own advantage, the smaller interests. Its members realize that there are grave difficulties in the way of the onward march of Independent telephony. In union there is strength. The united strength of the industry is what is needed to overcome these obstacles. Members are giving their best time and efforts to solving the many situations that are always coming to the fore in the telephone art and in the Independent movement.

The men comprising the Inter-State have their opinions and their views as to what is helpful to the movement and the industry. At the April Convention, some of these views and opinions were offered for free discussion. An immense amount of good came of the three days' session. In addition to the

benefits resulting from suggestions and discussion, the men came to know each other better, and to learn what was being accomplished in territory other than their own. They went back to their homes with renewed interest and hope in the business in which they are engaged.

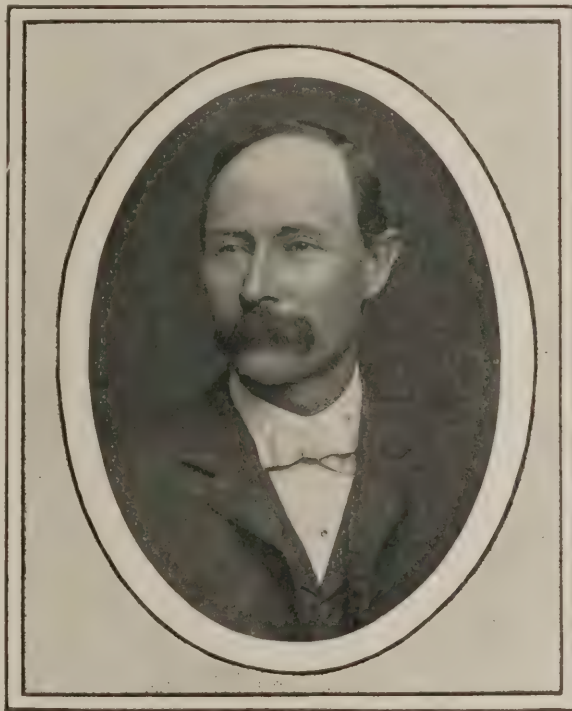
That is why Independents in the Middle West are looking forward to this December Convention. They are looking to it for help, encouragement and guidance. It is the belief of THE AMERICAN TELEPHONE JOURNAL that they will not be disappointed. The Inter-State will meet their expectations.

A program has been mapped out for this meeting that is the strongest in the history of the movement. A number of the best known men in the industry are down to give their opinions. Some of them have been in the movement since its inception, and they have given much earnest thought to the situation. They will tell what has been done, and outline plans for the future. They will not, however, dictate plans or policies to be carried out. In the limited time during which the Convention will be in session, it will be impossible for every member to read a paper. But each delegate at the Convention will have opportunity and has the privilege of discussing plans and giving his opinions and views, whether he represent a small or a large interest. His ideas and suggestions will meet with the same recognition as those of the most prominent man at the meeting.

The social side of the session has not been neglected in the program. There may be some who think too much time has been devoted to pleasure. But this is not

so. It has been frequently demonstrated that men get to know each other best, when they gather in a social way. And it is also recognized that a better acquaintance tends to more confidence. By meeting at Chicago and enjoying themselves in a social way, Independent delegates will gain more confidence in themselves and more confidence in the greatness of the Independent movement.

The manufacturers and dealers are to be commended for the good things they have prepared for the entertainment of the Inter-State delegates. They have nobly arisen to the situation. They have done everything in their power to cement the social relation. The officers of the Inter-State Association have left nothing undone that will contribute to the success of the business sessions. It will be the fault of neither, if delegates do not carry to their homes, renewed interest in their work, and a more friendly feeling for each other.



H. C. RANEY

President Inter-State Telephone Association.

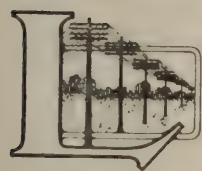


OPERATING ROOM OF THE LOUISVILLE HOME TELEPHONE COMPANY.
Stromberg-Carlson Apparatus.



LOUISVILLE

THE SOUTH'S IDEAL SYSTEM OF TELEPHONES



LOUISVILLE'S telephone system is model. Its construction is standard. Its organization and management is perfect; its operation faultless. Louisville has a population of 230,000. Of this number, 5,100 are now served by the Louisville Home Telephone Company. The switchboard has

an ultimate capacity of 12,600 lines, and a present equipment of 6,000. Up to date 6,500 contracts have been secured—500 more than the present capacity. To give connection to all these subscribers, an addition will be required to the switchboard equipment. These results have been accomplished so far, and the company has only been in operation three months. New contracts are being signed at the rate of about 300 a month. Taking these facts as a basis, it is a perfectly safe assertion that the Louisville Home Telephone Company will have 8,000 patrons on its first anniversary.

Before the Louisville Home Telephone Company entered the arena, Louisville's telephone service was an exclusive monopoly in the hands of the Cumberland Telephone and Telegraph Company, the subsidiary Bell company for the State of Kentucky. In the summer of 1900, the question of establishing an independent telephone company in Louisville was first agitated. At that time it is estimated that the Bell company served about

3,300 subscribers. Its construction was far from being up to date, its rates high, and the service very unsatisfactory.

Outside of Louisville, in Kentucky, and across the river in Indiana, there were hundreds of Independent exchanges located in every town of 500 or more people. Toll lines joined all these exchanges together. These Independent companies wanted connection with the Louisville merchants and business men, and the business interests of Louisville demanded connection with the nearby outside points. The Cumberland Company, not owning exchanges at any but a few points in these States, could not supply the service demanded. It refused to build exchanges in the towns that wanted the Louisville connection, and could not connect with the Independent exchanges already established. Therefore, the only method of securing the desired connection was the establishment of an Independent company in the city of Louisville. The result is the perfect plant of the Louisville Home Telephone Company.

An approximation of the number of stations now operated by the Cumberland is impossible, for the reason that it has installed and is now installing telephones free for sixty days' trial. Its last directory publishes the names of many subscribers who had discontinued its service and been connected with the Independent plant when the book was issued. The maximum number of bona fide subscribers, however, does not exceed 3,500.

The Cumberland Company's rates in Louisville in 1900 were about as follows:

Unlimited business service without contract.....	\$8.00 per month
Unlimited business service with 3-year contract.....	6.50 per month
Unlimited business service, 4-party line, no contract.....	4.00 per month
Unlimited business service, 10-party line, no contract.....	2.50 per month
Unlimited residence, no contract.....	5.00 per month
Unlimited residence, 2-party line, no contract....	3.50 per month
Unlimited residence, 4-party line, no contract....	2.50 per month
Unlimited residence, 10-party line, no contract....	1.50 per month

Since the establishment of the Independent service the Cumberland has considerably cut its rates. Its service, however, has been but little improved, and the general status remains practically the same. Its rates now, as nearly as can be ascertained, stand about as follows:

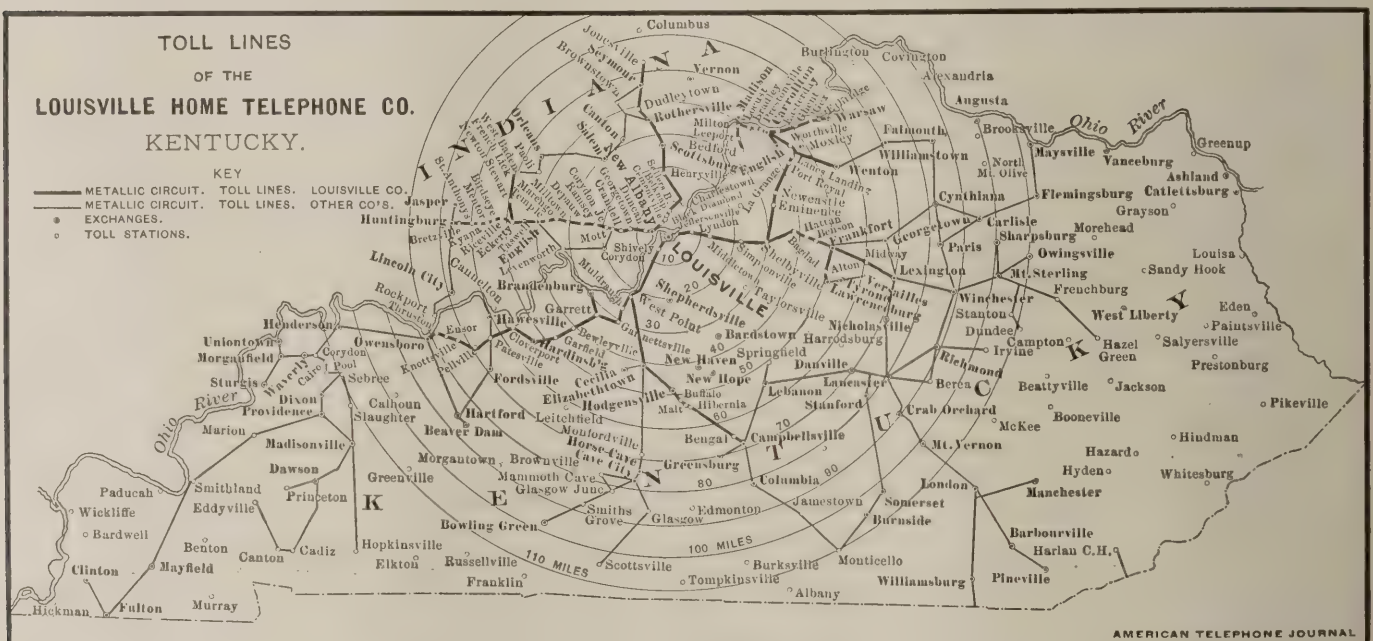
Limited, 4 stations, 60 outward calls, business....	\$3.50 per month
Private, 60 outward calls.....	5.00 per month
Unlimited, 4-party line.....	4.00 per month
Unlimited, 2-party line.....	5.00 per month
Private line.....	8.00 per month
Residence, limited, 4-party line, 120 outward calls, additional calls at 2 cents each.....	2.00 per month
Private line, 75 outward calls, additional calls 2 cents each.....	2.00 per month
Unlimited, 4-party line.....	2.50 per month
Unlimited private line.....	3.50 per month
Extension sets.....	1.50 per month

Ott Manufacturing Company; I. P. Barnard, president Louisville Tobacco Warehouse Company; W. R. Belknap, president of W. B. Belknap & Company; C. C. Bickel, president of C. C. Bickel Cigar Company; Helm Bruce, of Helm, Bruce & Helm, attorneys; John P. Starks, of Crutcher & Starks; Theophilus Conrad, president of Conrad Tanning Company; Basil Doerhoefer, tobacco manufacturer; W. W. Drummond, of W. W. Drummond & Company, iron manufacturers; S. Grabfelder, wholesale whiskey dealer; E. H. Ferguson, of the Globe Refinery Company; W. C. Garland, of Waters & Garland; Donald McDonald, president Kentucky Heating Company; C. C. McClarty, cashier First National Bank; Embury L. Swearingen, president Kentucky Title Company.

When the affairs of the company had reached their formative period the promoters went before the city council with a petition for a franchise. The authorities and also many local capitalists doubted the ability of an Independent company to erect a plant and operate it on a profitable basis at the rates mentioned and with the restrictions which the council insisted on incorporating in the franchise. At this time the Central Construction Company, of Toledo, Ohio, whose name carries considerable weight with financial men, was consulted. After investigating the conditions surrounding the telephone business in Louisville this company concluded to become interested in the building and operation of the plant. From that time everything progressed smoothly. A franchise was granted, and as soon as possible the actual work of construction was commenced.

THE CONSTRUCTION COMPANY.

The Central Construction Company is composed of Edward L.



The Louisville Home Telephone Company, on the other hand, has a uniform system of charging for its service. It has no party lines, every subscriber being furnished a full metallic private line with an unlimited service. For business houses it charges \$48 a year and for residences within the mile radius \$24, and outside of that line \$30.

THE HOME COMPANY ORGANIZATION.

The men who interested themselves in the formation of the Louisville Home Telephone Company were the representative business men of the town. The officers of the company are as follows: John A. Armstrong, president; Charles J. Doherty, vice-president; E. M. Coleman, secretary; John P. Starks, treasurer, and A. L. Têtu, general manager. These officers, with the exception of Mr. Têtu, are also members of the board of directors. Associated with them in the directorate are Ezekiel Rice and Edward L. Barber.

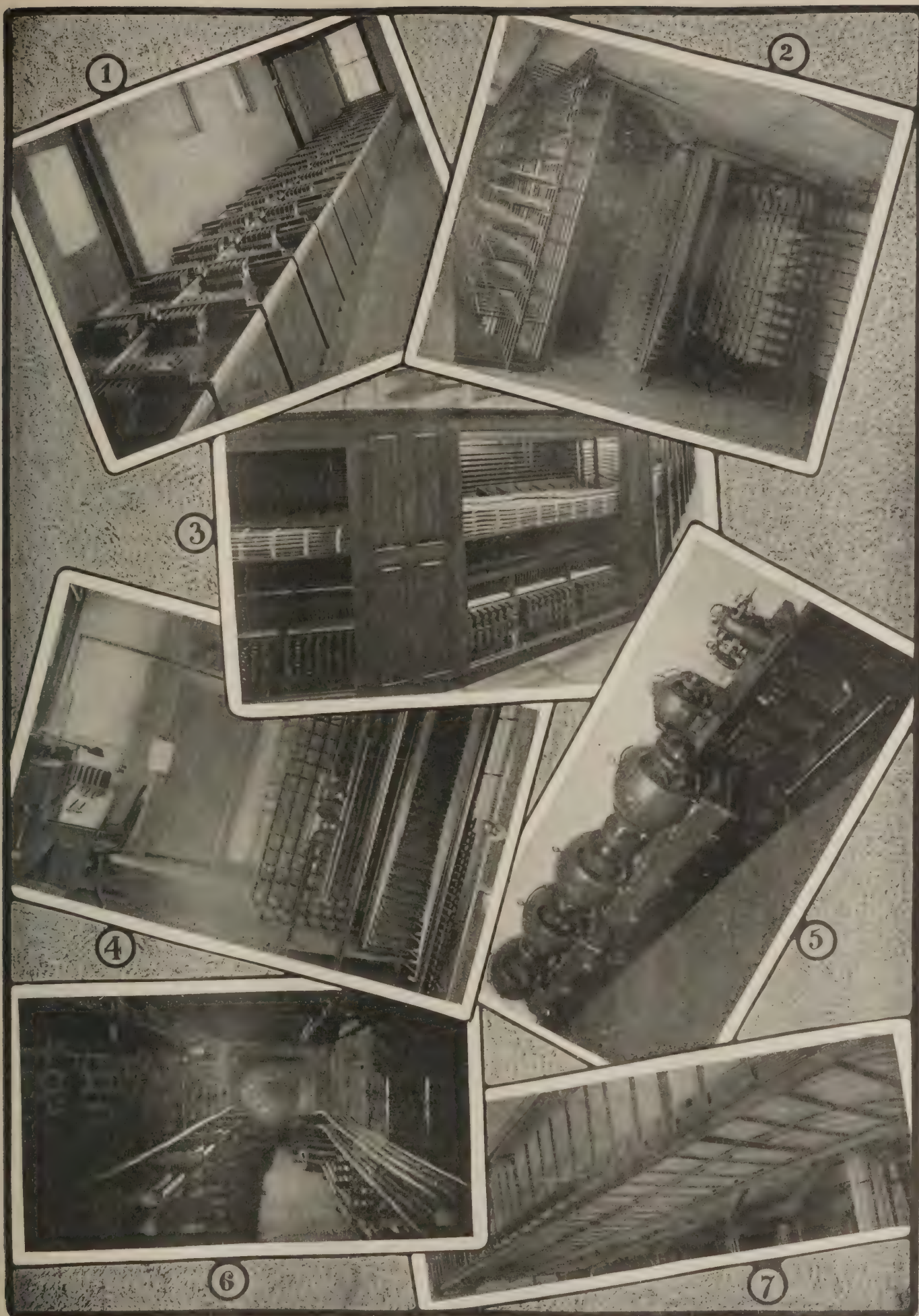
There are over 175 local stockholders, among whom may be mentioned G. W. Lewman, president First National Bank; Theodore Harris, president Louisville National Banking Company; ex-Governor W. O. Bradley, Theodore Ahrens, Jr., of Ahrens and

Barber, of Wauseon, Ohio, and James S. Brailey, Jr., of Toledo, Ohio. These men are practically the leaders of construction in the Independent telephone business. They have built nearly fifty plants, ranging from towns of 3,000 population up to a plant for 9,000 subscribers, which they are now building in Kansas City, and which will be completed in about a year.

When they interested themselves in the proposed Louisville company they demonstrated to the satisfaction of the financial interests of Louisville that a system could be maintained and operated upon a dividend paying basis at rates far below the Bell charges. They showed that Louisville could be made an important telephone center, connected with the Independent exchanges by toll lines to every town in the State of Kentucky and neighboring States.

THE HOME COMPANY'S FINANCES.

The financing of the company is on the following basis: It has a capital stock of \$1,500,000; \$1,200,000 of five per cent twenty-year gold bonds and \$1,200,000 of common stock have been issued. The total authorized bond issue is \$2,500,000. Of this amount \$100,000 is set aside as an emergency fund and \$1,200,000



LOUISVILLE HOME TELEPHONE COMPANY.

1. Storage Batteries. 2. Terminal Room. 3. Rear of Main Switchboard. 4. Cable Rack and Wire Chief's Desk. 5. Charging and Ringing Machines. 6. Cable Terminal. 7. Cable Run.

is retained by a trust company as treasury bonds to be used in extensions and additions to the plant. The bonds draw interest from July 1, 1902, the interest being payable semi-annually. The first payment is due January 1, 1903. The stock of the company has advanced ten points since the middle of September and is steadily growing in value. Local stockholders have subscribed for \$600,000 of bonds and \$600,000 of stock.

THE CONSTRUCTION ENGINEERS.

The construction of the system was under the immediate supervision of W. C. Polk, chief engineer of the Central Construction Company. Mr. Polk is one of the best known telephone engineers



A. L. Tétu, General Manager. J. E. Zeluff, Supt. Construction. John A. Armstrong, President.

LOUISVILLE HOME TELEPHONE COMPANY.

in the country to-day. For a number of years he was engineer of outside construction for the Central Union (Bell) Telephone Company in Ohio, Indiana and Illinois. He entered the service of the Central Construction Company in June, 1901, and since that time has superintended the construction of every important plant built by it. He is now superintending the work on the new Independent plant at Kansas City, Mo., and the one at Utica, N. Y.

J. E. Zeluff was Mr. Polk's assistant in the construction of the plant. Mr. Zeluff, like Mr. Polk has had a great deal of experience in this line of work. He is now superintending the construction of the toll and long distance lines of the Independent Long Distance Telephone and Telegraph Company of Kentucky. This company will construct and operate lines in Kentucky, and Southern Indiana in conjunction with the Louisville Home Telephone Company.

TOLL LINE CONNECTIONS.

Toll lines connecting 700 important Kentucky and Southern Indiana points have been completed by the Independent Long Distance Telephone and Telegraph Company. The map shows the connections that have thus far been established. Many new lines are in course of construction, and others are contemplated. Within a short time connection will be made with the New Long Distance Company of Indiana which has toll lines connecting all Indiana Independent exchanges. Eventually the Louisville Home Telephone Company will have toll lines to every point in all neighboring states—the most valuable commercial toll line system of any company in the South.

The rates are based on a charge of two-thirds of a cent per mile for five minute conversations. The Bell company charges the same rate with the exception that its rate is based on three minute conversations.

THE EXCHANGE BUILDING.

In laying out the plant of the Louisville Home Telephone Company, the central office was established in the most desirable location in the city, from the operating standpoint. It is situated, in the heart of the city, due allowance being made for future growth. It is a three story brick structure, with basement and attic, the front being of attractive pressed brick. The architect was J. J. Gaffney, of Louisville. The building occupies a space of 52½x130 feet. It is completely isolated from all surrounding buildings,

being bounded on two sides by 6-foot alleys and on the rear by a 50 foot lot, the property of the company. This arrangement admits of plenty of light and air, and also lessens the dangers of a conflagration spreading from adjoining properties. A novel arrangement and one of the utmost value, is the convent wall. This is a wall sixteen feet high immediately in the rear of the building, surrounding the store yard. The space included in this wall measures 57x73 feet and in one corner is a warehouse. A doorway admits of the entrance of wagons from the alley. At night, construction wagons are driven in here loaded, the large heavy steel-bound sliding door is closed and there is no necessity for unloading. The wall relieves all dangers from thieves or in the event of a strike, serves as a protection to the property of the company.

On the third floor of the building the operating department is located in a room 50x90 feet with a 19 foot ceiling. In close proximity to this, for the use of the operators, is a recreation room, 19x25½ feet, and a dining room 16x19 feet, so arranged that they can be thrown together. A hospital room, 8x20 feet is provided; also a locker room, fitted with individual wire lockers, 15x17½ feet, a dressing room 9x20 feet and bath and toilet room 9x20 feet.

An entrance exclusively for the operators is placed on one side of the building about 30 feet from the street.

In the rear of the operating room a large door 6 feet wide and 10 feet high is located directly above the convent wall enclosure. The advantage and utility of this door is apparent. Heavy bulky apparatus is hoisted from the store yard and easily pulled in through the door without any interference to the office or operating department.

The heating, lighting and ventilation of the entire building is based on the latest hygienic rules. It is heated by an improved hot water system, and ventilated and cooled by noiseless electric fans. The operating room is kept at an even temperature winter and summer by a five horse power electric fan placed in the attic. The fan is connected with ventilating boxes in the floor and ceiling and is so arranged that the air can be withdrawn or forced into the room at will.

CENTRAL OFFICE EQUIPMENT.

The operating and subscriber's apparatus represents the highest standard in modern telephone engineering, both as regards finish, design and materials, and also installation. A good idea of all apparatus can be gained from the photographs. The Stromberg-Carlson Telephone Manufacturing Company,



Jas. S. Brailey, Jr., General Manager. W. C. Polk, Engineer. Ed. L. Barber, President.

CENTRAL CONSTRUCTION COMPANY.

furnished the exchange equipment and subscribers' sets. All apparatus is of the latest and best design manufactured by this company. The entire central station equipment was installed under the immediate supervision of the Stromberg-Carlson Company's engineers. All apparatus is arranged in such a manner as to economize in the matter of space, and at the same time give quick and efficient results and facilitate necessary repairs.

The switchboard is an automatic signal relay multiple board, having twenty-five sections of three operator's positions



MAP SHOWING
 UNDERGROUND AND AERIAL LINES
 OF THE
LOUISVILLE HOME TELEPHONE COMPANY
 LOUISVILLE, KENTUCKY.

- KEY
- UNDERGROUND CONDUITS ———
 - AERIAL CABLE LEADS - - - - -
 - POLE LINES
 - UNDERGROUND TERMINALS •
 - EXCHANGE ■

each, arranged in the form of a horseshoe. The first three sections are incoming trunk line sections, providing eight "B" positions. The remaining twenty-two sections are subscriber line sections having 60 "A" operators' positions, arranged for additions without altering the present equipment.

At the center of the curve is an arch to permit egress or ingress of the operators. The passage thus formed directly connects the operating room with the operators' quarters and front stairway.

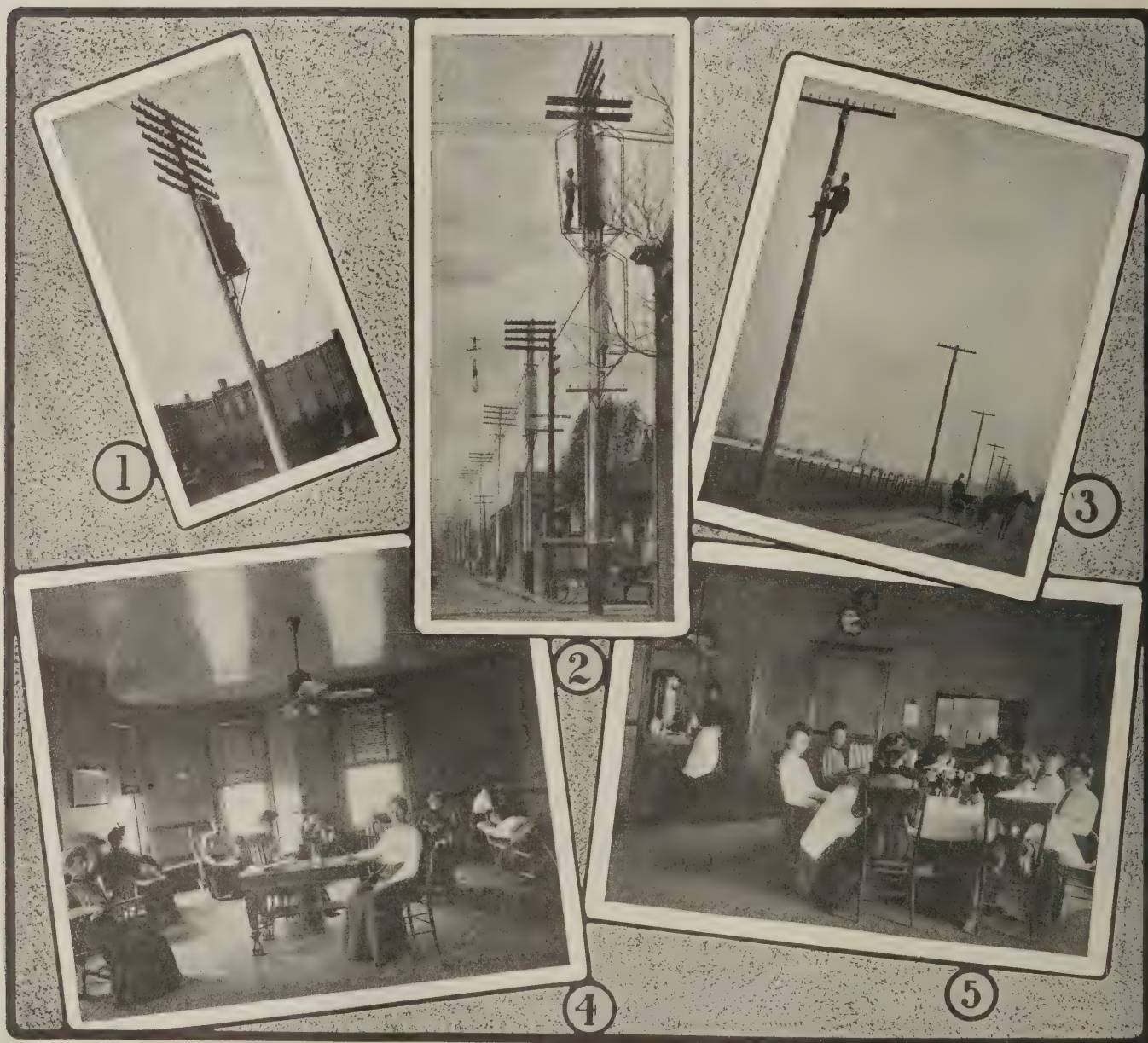
The switchboard is equipped for 6,000 subscribers' lines; twenty outgoing trunks to an exchange at New Albany; twenty recording trunks to toll board; twenty trunks to manager's desk, chief operator's and assistant chief operator's desk, information clerk's desk and wire chief's desk; ten incoming trunks from supervisory desks, and fourteen trunks from New Albany. The incoming trunks terminate on plugs and cords with associated disconnect lamps, ringing and listening keys and accessory apparatus.

Each regular subscriber's section is arranged for an ultimate capacity of 12,600 multiple jacks in nine panels. Trunk space is provided for 360 outgoing trunk jacks, space is provided for 450 subscribers' answering jacks and lamps, ten per strip, with a present equipment at each operator's position of 100 line equip-

ments. Each "A" operator's position has 15 pairs of connecting cords, with double lamp supervisory signals, ringing and listening keys and accessory apparatus. Each position is further equipped with 10 order wire keys for outgoing trunks. Busy back jacks are provided in each section.

A call "pilot" lamp is provided in each position, so wired that when a call comes in the pilot lamp lights and remains lit as long as any unanswered call remains. The corresponding lamp lights in each of the monitor operator's desks, notifying these operators that unanswered calls exist on these positions. The monitor operators make immediate investigation, which results in prompt service to subscribers. These line pilot lamps also ring a night bell. Each operator's position is equipped with a ringing lamp, indicating to the operator whether the line upon which she rings is clear. If the line is open, the lamp fails to light. The operator thereupon notifies the trouble clerk.

Each section of switchboard frame is made of mild steel, securely fastened and perfectly rigid. The cabinet work is quarter-sawn oak, stained golden oak, and given a high-grade finish. The archway adds to the general appearance of the board and has the effect of a triumphal arch at the entrance. The key-boards are made up of 5-ply wood, of the same quality as that of



LOUISVILLE HOME TELEPHONE COMPANY.

1. Distributing Pole. 2. Cable Pole and City Pole Line. 3. Long Distance Lines. 4. Operators' Recreation Rooms. 5. Operators' Dining Room.

the cabinet work, hinged and provided with locks and uniform keys. The cord and plug boards are covered with the best grade of belt leather.

Each operator's section is provided with a fuse board for each individual cord pair, supervisory circuits and operator's circuit. The supervisory apparatus and also that of the telephone set is mounted in the rear of the respective switchboard sections, accessible for inspection and repairs. The front panels below the keyboards and likewise the rear panels are removable.

The multiple jacks in banks of 100 are mounted in the upper part of the switchboard sections, starting at the base of the multiple space and building up, progressing from the left to right and upwards, the unequipped spaces being filled with ebonized panels. The multiple jacks corresponding to the total number of answering jacks installed, appear in each section of switchboard.

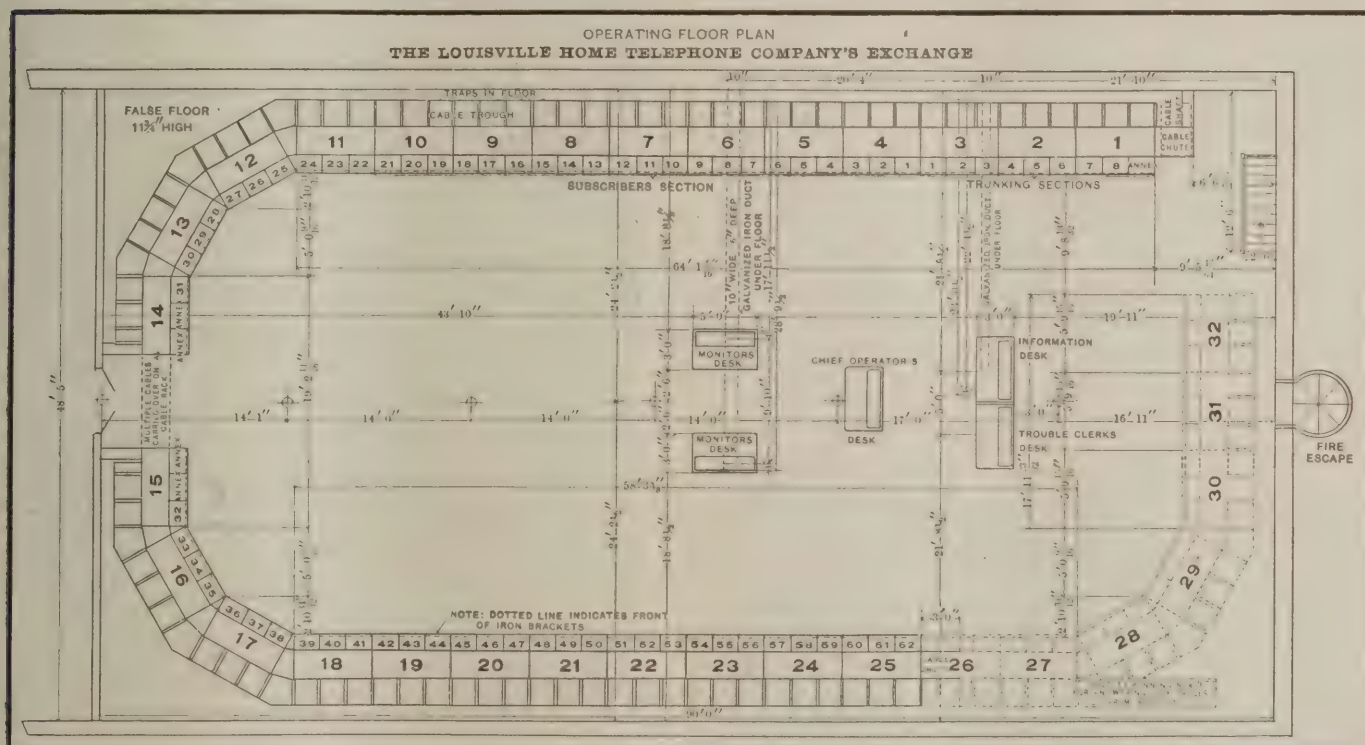
The stile strips are stamped with the hundred and thousand numbers. The numbering of the jacks in banks of 100 is further designated by white vertical lines, dividing each row of 20 jacks in four parts of five each, making it easy for an operator at any position to immediately find any jack of the whole multiple.

Each multiple jack consists of a tip and sleeve spring, and a busy test thimble metallically connected with the sleeve spring. Two wires extend through the multiple per line, with no contacts other than soldered connections. No battery exists on the sleeve

that the light is uniformly distributed on the multiple without causing any annoying glare. There is a wall key socket in each section for repair illumination.

The wiring of light and battery circuits is done with the best grade of rubber-covered braided copper wire. The capacity of the battery wires is sufficient to prevent cross talk. Separate ringing leads are provided for each section, protected at the fuse board by a lamp and fuse. The resistance of the ringing relays is sufficient to prevent interference among operators on the same ringing circuit in case any one rings on short circuited lines.

The operation of the switchboard is as follows: When a subscriber removes the receiver a line signal lights and remains lit until the operator inserts the front plug of a pair of cords into the corresponding answering jack. When this plug is inserted the lamp-line signal is extinguished. The desired number being ascertained the connection is made in the usual manner by inserting the mate plug into the called subscriber's multiple jack. Immediately upon the insertion of this plug the corresponding clearing-out lamp lights and remains lit until the called subscriber answers, when it is extinguished and remains out during the conversation. The respective lamps light when the corresponding subscribers replace their receivers, indicating to the operator that the connection is finished. These lamps remain illuminated until the connection is taken down. In case a subscriber desires



AMERICAN TELEPHONE JOURNAL

or thimble of any multiple or answering jack, unless a partial or complete connection is established by an operator. The marked simplicity of the jack, the high-grade workmanship and excellent quality of materials used, renders the jack proof against defects, and the wear due to usage is reduced to a minimum. The outgoing trunk jacks are multiplied in each section rendering them accessible to each "A" operator.

The answering jacks are mounted in strips of ten associated with call lamps. The lamps are one-third candle power, readily accessible from the face of the board. They are fitted in sockets and protected by opals that appear immediately above the answering jacks. The opal strips are readily removable, to permit access to the lamps. The lamps are numbered in panels, having corresponding numbers on the answering jack side of the intermediate distributing frame. The answering jacks are numbered by removable plates stamped with the numbers, easily changed when cross-connections are made on the intermediate distributing frame.

The switchboard is illuminated by incandescent lamps mounted on the top of the board in duplex brackets, equipped with green half-pear shades. There are two lamps for each section, so set

a connection with a subscriber in the neighboring exchange at New Albany, the line operator answers in the ordinary manner, takes the call and orders up the connection over an order wire circuit to the "B" operator at New Albany. The New Albany operator completes the connection, and when the subscriber at New Albany hangs up the calling lamp on the cord pair in use by the regular "A" operator is lighted, and if the Louisville subscriber likewise hangs up his telephone, the corresponding answering lamp lights, which is a signal for the "A" operator to disconnect. The "A" operator on disconnecting, lights the disconnect lamp on the trunk cord at New Albany, which is a signal for the trunk operator to disconnect. If a subscriber desires a connection on a toll line, the subscriber operator trunks the connection to the required toll operator on special trunks, and the toll operator takes the connection. If calls are made for chief operator, information operator, manager, or wire chief, the subscriber's operator trunks the call directly to the desired supervisory desks.

A complete system of supervisory desks is installed, consisting of a one-position manager's desk, a two-position chief operator's desk, a two-position information operator's desk, a two-position

wire chief's desk and two one-position monitor desks. Each consists of a flat-top desk equipped with a monitor cabinet. The keyboards are hinged. The plug shelf is covered with leather. The front and rear panels of the boards are made removable, so as to permit quick access to the interior. The cabinet work is made of quarter-sawed oak, finished in golden oak, and conforms



HINGED MANHOLE COVER OPEN.

in appearance with the main switchboard. Each of the supervisory desks, excepting the monitor desks, are provided with incoming and outgoing trunks, connecting cords and operator's telephone equipments complete. A system of intercommunicating lines runs between the various desks.

The chief operator's, information operator's, and wire chief's desks are provided with "howler" attachments, so that in case a subscriber fails to hang up his telephone the "howler" can be applied to the line, which produces a howl of sufficient intensity to attract the subscriber's attention. The monitor operator's desks are equipped with line call pilot lamps, one corresponding to each operator's position, that light whenever a call comes in on the position with which the lamp is associated. There is also a jack wired to each of the subscriber operator telephone cir-



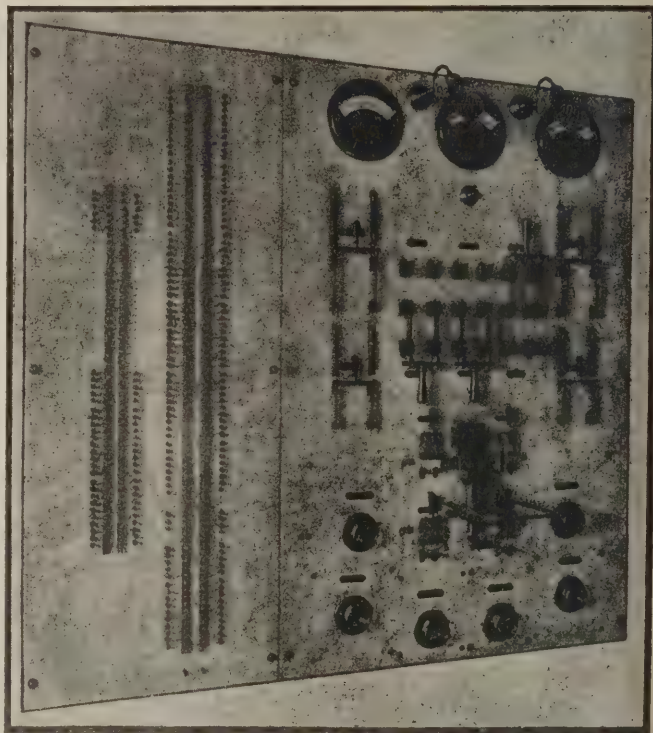
HINGED MANHOLE COVER.

cuits, and likewise a monitor key, so that the monitor operator can monitor each and every subscriber operator without that operator's knowledge, either by pushing a monitor key or by plugging the monitor jack. The monitor operator can talk to regular operators by throwing a key. The total equipment is installed in each of the two monitor operators' positions so that

the whole exchange can be monitored from either position at night or on Sundays.

The wire chief's desk is a two-position desk, each position equipped with instruments for testing the insulation and capacity and also for locating trouble. Test cords are provided at the main distributing frame, so as to enable the wire chief to test trouble either out or in towards the switchboard. Special test plugs are provided on the last position of the multiple, so that any trouble may be located between the last position of the subscriber board and the main distributing frame. Special apparatus is likewise provided to enable the wire chief to test on toll lines. The wire chief's desk is located in the terminal room, so as to permit the wire chief to have complete supervision over the terminal apparatus.

A special system of terminal racks is designed for terminating all cables and for mounting relays. These main, relay and intermediate frames are built in sections and mounted parallel to one another and interbraced so as to make a firm and compact structure. All parts are of mild steel bolted together. Each section of main, relay and intermediate distributing frames are built so as to occupy the same floor space in length and contain the respective apparatus corresponding to the same number of lines, thus permitting cabling from the lightning arresters equipment to the corresponding relays on the relay rack, and to the corre-



POWER BOARD.

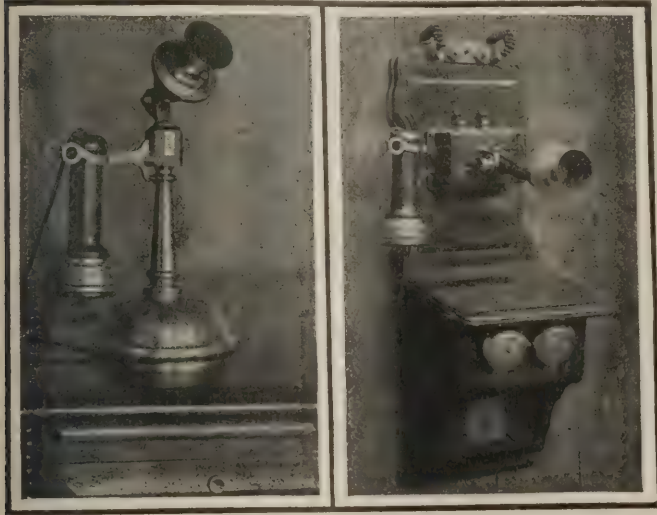
sponding terminals on the intermediate distributing frame, and thence to the switchboard. Additional sections can be added as required, making the total lengths of the racks the same and of such capacity as to meet the requirements of the exchange. The present capacity of the racks is for 7,200 subscriber lines, equipped for 6,000 subscriber lines, with additional equipment for the toll and trunk lines.

The main distributing frame contains on the horizontal side the line cables. The terminals are mounted in blocks of 25 pairs, grouped in sets of six, for 150 pair cables, numbered consecutively from 1 to 299, numbering the odd conductor of each pair. The terminals are brass mounted on rubber strips and tinned. The blocks are on horizontal shelves with the terminal blocks mounted vertically. Twenty-five per cent. greater terminal capacity is provided than lightning arrester capacity, to allow for excess cables.

The lightning arresters are carbon type, with mica separators, and the heat coil sneak current arresters are mounted in pairs on vertical strips of 200 pairs each, numbered to correspond to the subscriber. Cross-connecting rings with enameled surfaces are arranged to permit cross-connections either horizontally or verti-

cally from any cable pair to any arrester pair without the necessity of threading wire.

The relay rack is parallel to the main distributing frame, of double bays, with all wire and cable formed in the middle. The relays are mounted on iron strips, copper-plated, twenty pairs per strip. Each pair of line and differential relays are mounted in dust and inductive-proof shells, all parts insulated from the mounting plates. A fuse board is provided at the base of each bay of relays for fusing each strip of twenty-line terminals.



DESK AND WALL SUBSCRIBERS' SETS.
Stromberg-Carlson Type.

The intermediate distributing frame has the multiple and answering jack terminal strips. The terminal strips are 100 pairs, of rubber with brass terminals. The numbering on the multiple strips corresponds to the subscriber line numbers, and the numbering on the answering jack terminal strips corresponds to the line numbers, being sub-divided in panels. Provision is made for cross-connecting between the multiple terminals and answering jack terminals, so as to permit any multiple jack to be cross-connected to any answering jack. Triplex jumper wire is used for this purpose.

The system of racks is arranged so that all cable is carried overhead, and space provided between the racks for easy access. Iron racks are provided for carrying the multiple and answering jack cables from the intermediate distributing frame to the first section of the board, which is immediately over the main distributing frame. A special answering jack cable run is provided for carrying the answering jack cables to the portion of the switchboard on the opposite side of the operating room.

The cabling is done in a very compact and substantial manner. All cables are of No. 22 B. & S. gauge tinned annealed copper wire, 98 per cent. pure, covered with two layers of silk and one of cotton. The outside wrapping of each pair is dyed in accordance with a predetermined color code. The copper is tinned and all traces of acids and salts removed. No soldering paste was used throughout the installation in connection with the cable system. No joints or splices are made in any conductor. Each pair of conductors is uniformly spiralled, one about the other, with twists not less than seven to the foot. Each cable is substantially covered with a hard smooth finish and treated with a fire repellant. The cables are free from cross talk on all pairs.

The cable between the main relay racks, likewise the relay racks and intermediate distributing frame, is laid up on forms and tied into position. The cabling from the multiple side of the main distributing frame through the multiple is of 100-pair cable. The cabling from the answering jack side of the intermediate distributing frame to the various operators' positions is of 63-wire cable, the talking wires being paired. For economy in answering jack cable, one branch of cables was carried across the terminal room to connect with the answering jacks on the opposite side of the operating room.

A complete 40-volt-power and battery plant is installed. There is a double set of charging machines, made by Roth Brothers, each of 12 k.w. capacity, one to operate on a 500-volt direct power circuit, and the other on a 220-volt power circuit. The output

of each generator is 200 amperes at 60 volts. There is a Roth Brothers' ringing dynamotor, primary to operate on 500 volts direct current, secondary delivering a current of 100 volts alternating, equipped with a "howler," "busy-back," and "intermittent" ringing attachments. A ringing dynamotor is also provided to run the storage battery.

The power machines are on a suitable sub-base, so mounted that no vibration is transmitted to the floor on the operation of the machines.

The power board consists of an Italian white marble slab having two Weston flush type ammeters, scale 0 to 200, one to indicate the charging current and the other the discharge current; one Weston flush type voltmeter, double scale, 0 to 3 and 0 to 75, and a 6-point voltmeter switch, to obtain the voltage of different parts of the power circuits and that of the individual cells.

There are three 200 ampere double pole, double throw knife switches for the charge and discharge circuits, and two 50 ampere 500 volt double pole single throw knife switches for the motor generator; two 25 ampere double pole single throw 500 volt knife switches for the ringing generator, together with the necessary switches for the ringing circuits. An underload and overload I. T. E. circuit breaker is installed in connection with the charging machines. The power board is illuminated by incandescent lamps mounted on brackets.

All apparatus mounted on the face of the board is copper-plated and polished. Designation strips are provided in connection with each of the switches to prevent possible accidents. A fuse panel is provided with the power board.

The battery plant for the operation of the switchboard consists of two sets of 20 cells each of Electric Storage Battery Company's accumulators in lead-lined tanks, "G" type. Provision is made for ultimate battery capacity for 12,600 lines, each set of batteries to be sufficient for the whole exchange for twenty-four hours without recharging. The storage batteries are at present sufficient for the immediate operation of 7,000 subscribers' lines. As the number of subscribers increases additional elements can be added.

All wires in connection with the power plant are run in iron armored conduit, and circular loom is used for insulating.

THE OUTSIDE CONSTRUCTION.

Outside of the exchange proper the construction is on the same comprehensive scale. Its equipment is sufficient for all present requirements and is flexible enough to allow of future extensions at comparatively small expenditure and inconvenience.



STOREYARD AND CONVENT WALL.

One of the novelties is the form of manhole cover. This is shown in two paragraphs, one open, and one closed. The cover is hinged to the manhole, and when opened is held in place by an iron bar which is concealed in the manhole when not in use. This arrangement serves a double purpose. It is handier to manipulate and acts as a guard to traffic.

The conduit system contains 535,460 duct feet or 101.4 miles, and required 48,188 feet of trench excavation. There are 161 manholes. The conduit used is of the McRoy multiple type. Underground cable to the amount of 240,000 feet, or 45.4 miles, has been installed apportioned as follows: 150 feet of 30 pair, 1,650 feet of 50 pair, 3,100 feet of 60 pair, 4,200 feet of 100 pair, 2,300 feet of 120 pair, 228,000 feet of 150 pair. This cable was furnished by the John A. Roebling's Sons Company, of Trenton, New Jersey, and the Standard Underground Cable Company, of Pittsburg, Pa. The wire is all dry core paper wrapped No. 19 B. & S. gauge copper. All main cable used in the conduit system is 150 pair, the smaller sizes being used for the laterals.

The aerial cable measures a total of 288,000 feet, divided as follows: 6,000 feet of 25 pair, 7,000 feet of 30 pair, 60,000 feet of 50 pair, 35,000 feet of 60 pair, 40,000 feet of 100 pair, 15,000 feet of 120 pair, 125,000 feet of 150 pair. This cable is dry core paper wrapped No. 22 B. & S. gauge, and was also furnished by The John A. Roebling's Sons Company, and the Standard Underground Cable Company.

Over 2,200 miles of aerial wire was used. This wire is No. 12 B. & S. copper, and No. 14 B. W. G. iron and No. 12 B. W. G. iron, the copper being used for the down town district and manufacturing localities, the No. 14 iron being used in the outskirts of the city where the atmospheric conditions are quite favorable to its use, and the No. 12 iron wire being used on country lines, the percentage being about as follows: 6 per cent. No. 12 iron, 54 per cent No. 14 iron, 40 per cent. copper.

Practically all aerial wire was furnished by The John A. Roebling's Sons Company.

There are 7,500 poles used in the construction, ranging in height from 25 to 65 feet, seventy per cent. of the entire number being 40 feet or over. Forty per cent. of the poles are cedar, and sixty per cent. are chestnut. The cedar poles are Idaho Western Cedars. The chestnut poles were obtained principally from local points in Kentucky. All of the street work and trunk line poles in exposed places are Idaho cedar. Chestnut poles are used in alleys and outlying districts. The cedar poles were furnished by Lindsley Brothers Company, Valentine Clark Company, W. C. Sterling & Son, and J. H. Fowler. The chestnut poles were obtained from Biggs & Lawson, of Greenup, Ky.; J. H. Collier, of Crab Orchard, Ky., and the Chattanooga Pole Company.

Insulators were furnished by the W. G. Nagel Electric Company, of Toledo, Ohio. Boston cable clips are used.

Cross arms and locust pins were furnished by the Central Manufacturing Company, of Chattanooga, Tenn.

Cable boxes were made locally, being of white pine with galvanized tops, fasteners, etc.

The greater part of the hardware, all of which was galvanized, was furnished by the McIntosh-Huntington Company, of Cleveland, Ohio, and Hubbard & Company, of Pittsburg, Pa.

The strand was furnished by The John A. Roebling's Sons Company.

Connections are made with the Independent telephone plant at New Albany, Ind., by means of a trunking cable carried over the Ohio river attached to the Kentucky & Indiana Railroad bridge. Although this bridge has a draw span, which necessarily must be opened, yet the aerial cable is carried entirely over and clear of this draw span by the attachment of a mast pivot fixture in the center.

THE MANAGERS OF THE COMPANY.

As with all Independent telephone companies, the strong point of the Louisville Home Company is the fact that its management is in the hands of local people—men well known to the telephone subscribers—Mr. Armstrong, the president of the company, is one of Louisville's most prominent retired business men, and a man of splendid executive ability and large means. The vice-president, Mr. Doherty, is a well known attorney of Louisville. Mr. Coleman, secretary of the company, is a prominent resident of Louisville, and Mr. Starks, the treasurer, is a Louisville merchant of high standing. Mr. Têtu, the general manager is conceded to be one of the best operating and traffic managers in the country. His first introduction to the electrical industry was with the Mutual District Telegraph Company, of New York. He left this company in 1892, and became the manager of the main office of the Chicago (Bell) Telephone Company. Although he had had no previous experience in the telephone business, his ability soon won for him the position of general city manager of the entire operating department. He served in various capacities with this and other Bell companies, always making operating management his specialty. Just prior to his connection with the Louisville Home Telephone Company, he was with the National Cash Register Company.

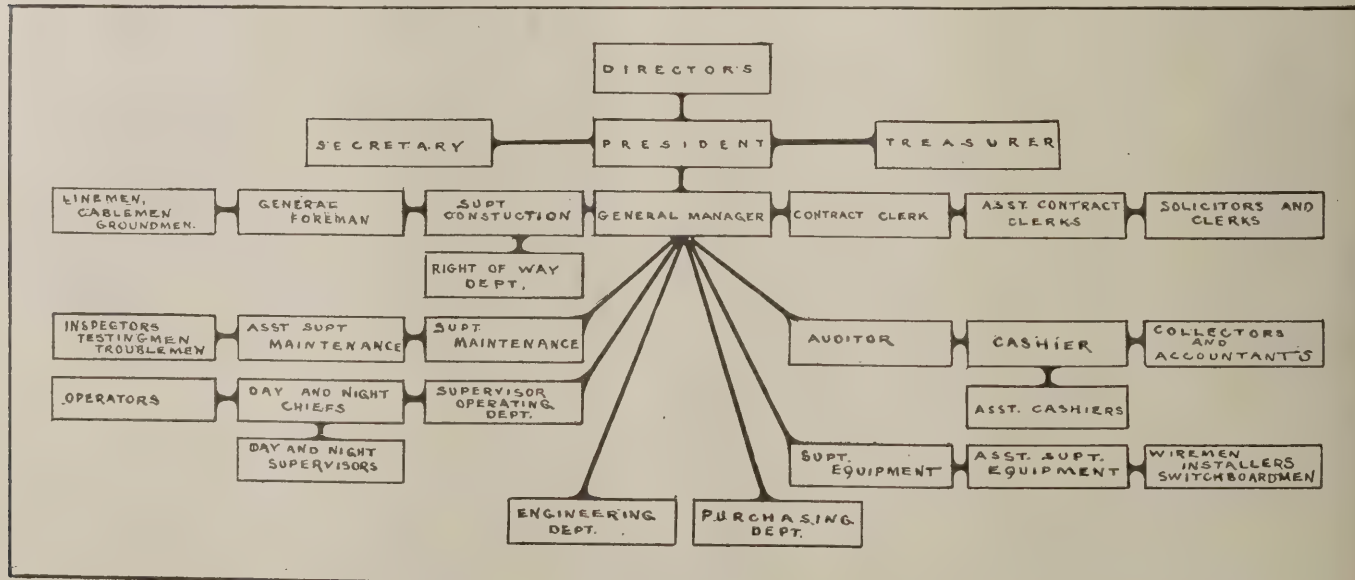
PRESENT TRAFFIC OF THE COMPANY.

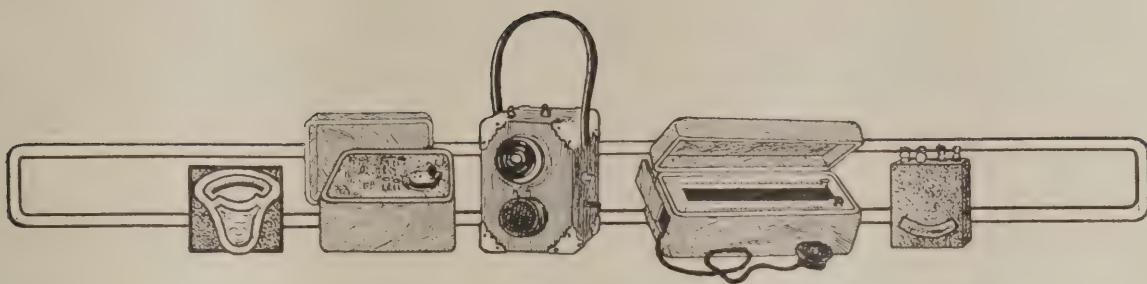
Louisville's citizens are and have a right to be proud of their new telephone system. The discipline of the operating room is perfect, each operator handling the maximum number of calls. The present capacity of the plant is run to its utmost to handle the traffic.

On November 11, 12 and 13, the company kept a peg count of the number of calls handled. On November 11 a total of 63,144 calls were registered; on November 12, 58,387 calls; and on November 13, 60,068 calls. The busiest hour during that time was on November 11, between the hours of 9 and 10 A. M., when a total of 5,280 calls were handled. Between 8 and 9 A. M. on November 12, there were 4,940, and on November 13, between 9 and 10 A. M., 5,000 calls. The average number of calls per subscriber on November 11, was 12 8-10 calls; November 12, 11 8-10 calls; and on November 13, 12 1-10 calls.

Since the plant has been in operation inspectors of the company have been making tests of the rapidity of the service. They make an average of 100 calls a day from subscribers' stations, and altogether have made about 1,100 tests. Averaging these tests the answering time has been 1 9-10 seconds.

ORGANIZATION CHART OF THE LOUISVILLE HOME TELEPHONE COMPANY.





TELEPHONIC TESTING—ARTICLE I.

By KEMPSTER B. MILLER AND WILLIAM W. DEAN.

TELEPHONIC TESTING deals with the determination and location of faults or troubles in telephone lines, instruments, switchboards or power apparatus; the determination of the operativeness of a proposed system, and the relative efficiencies of various pieces of apparatus from which a selection "of the fittest" must be made.

ingenuity and common sense in solving the infinite variety of problems that constantly arise. Although often arduous, it cannot be denied that the work is fascinating.

The telephone company that keeps its cases of trouble as few as possible, and which clears those which do develop in the least possible time—perhaps before the subscriber discovers them—has made one of the greatest of steps toward good service, and, consequently, success. Likewise, the employe who understands the art of "trouble shooting" and who is able not only to remedy difficulties quickly but actually to prevent them is not likely to

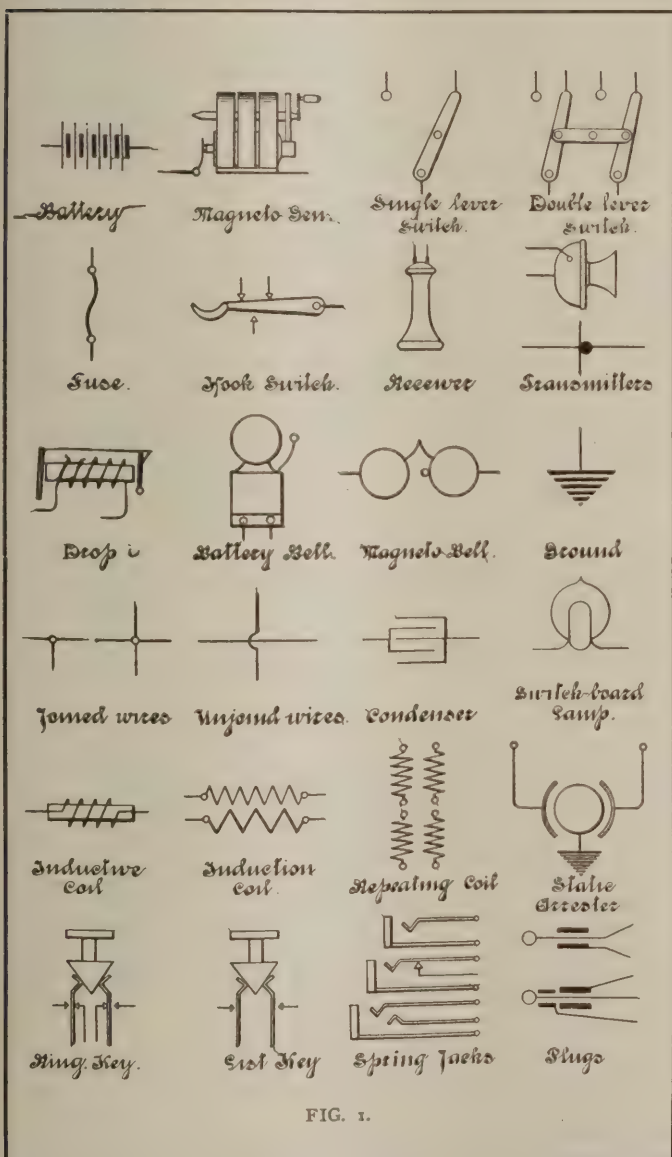


FIG. 1.

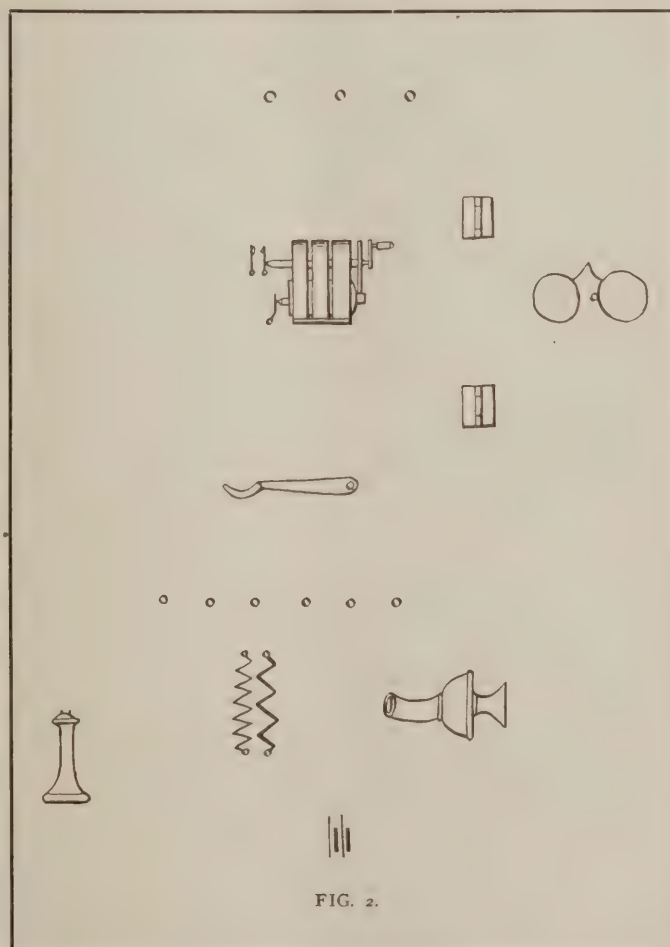


FIG. 2.

Testing in telephony is more varied than that in the other electrical industries. It involves both rough and refined electrical measurements, and affords an unlimited field for the exercise of

remain long at the bottom of the proverbial ladder. But the trouble man who clears trouble by "happening across" it is just as likely to happen to introduce other and worse trouble in the process. He resembles a physician who would give a patient all the remedies of his profession in order to be sure to include the right one. The trouble man who begins by unsoldering connections, substituting parts and mixing up things in general, soon has so many new cases of trouble on hand that the original one

is lost sight of; and while it may be remedied, is never found and is liable to arise again at the most inconvenient time. Every trouble man should begin by studying the case. He should first acquaint himself with the system and be thoroughly familiar with all its workings. He should then proceed step by step in a systematic way, and without changing or altering, to find out what is right and what is wrong. This done, he should proceed to remedy what is wrong, leaving the other portions untouched. He will thus not only have cleared the trouble, but be able to make an intelligent report, specifying ways of preventing similar occurrences in the future.

The importance of diagnosing a case of trouble, of determining by preliminary tests and by the use of whatever brains and instruments are available, cannot be overestimated. It is the keynote to the whole art of "trouble shooting," and it is more the object of this work to aid in the determination of the nature and location of the trouble than to show how it may be removed when found, for in telephony the remedy is usually obvious.

One of the greatest aids to the preliminary understanding of a piece of telephone apparatus or a system, and the best basis for the work of the trouble man, is a clear diagram. The drawing of diagrams is simple and one can, with a little practice, make a fairly good one of almost any electrical system, whether he be a competent draftsman or not. This subject is of such importance and is so infrequently used that some attention must be devoted to it.

Illustrations of electrical systems by diagrams has become quite common, and a fairly well defined code of symbols has been adopted, each symbol being as simple as possible and at the same

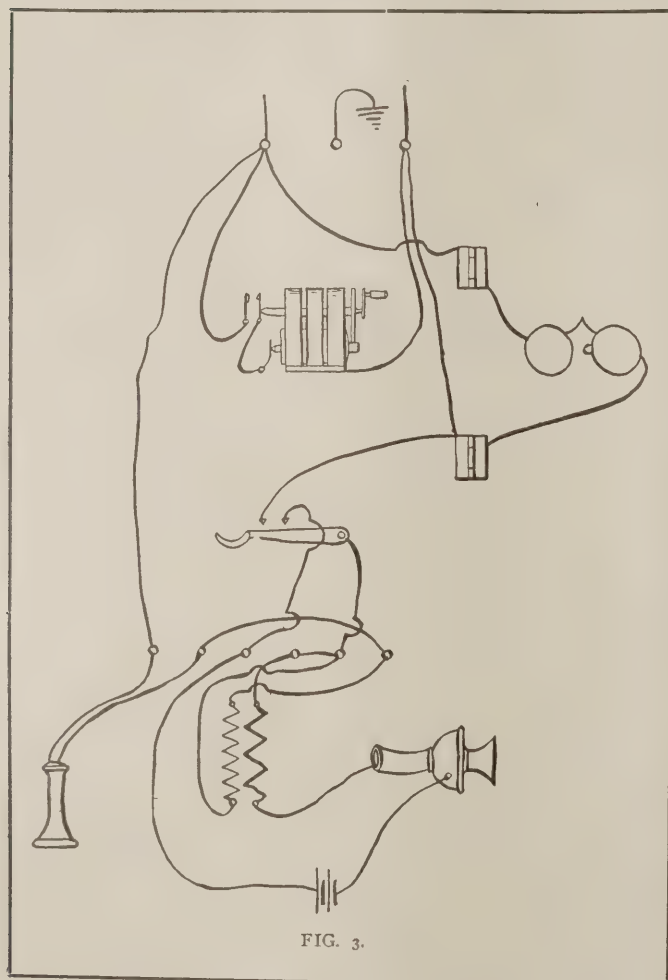


FIG. 3.

time suggestive of what it is to represent. Fig. 1 shows a few of the more common symbols used in telephony. These are self-explanatory. No code of diagrams can be rigidly adhered to on account of the possible modifications in the details of telephone apparatus. Thus, a hook switch may have two lower contacts or none; a magneto generator may have a shunting or a cut-in device requiring different numbers of contact springs, according to the nature of the circuit. Such modifications may with a little ingenuity be supplied.

Suppose that one has a bridging telephone, the circuits of which he does not understand and of which he wishes to make a diagram. A good way is to draw in the various pieces of apparatus regardless of connections, maintaining their relative locations. Some such sketch as is shown in Fig. 2 is the result.

By carefully tracing out the various wires, connectors and cords one may then indicate the various connections on the dia-

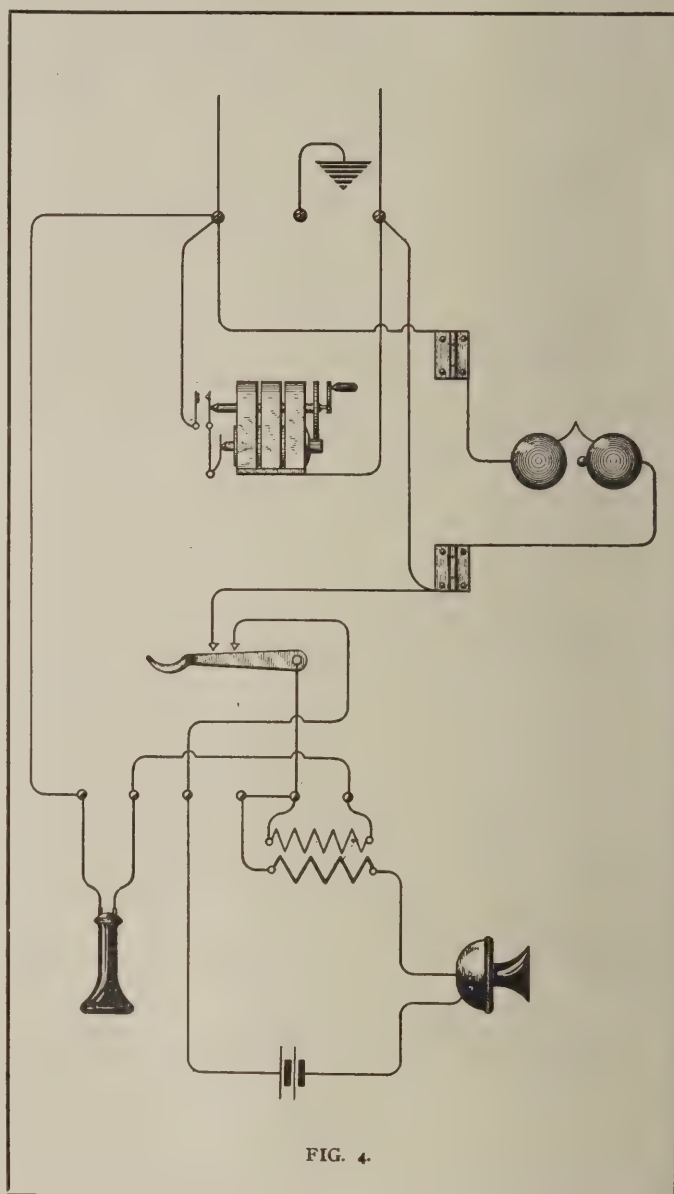


FIG. 4.

gram. Thus, one notes that three wires lead from the left-hand binding post on top of the bell box, one terminating in the upper hinge of the lid, one in a contact spring on the generator "cut-in" and one in the left-hand binding post. By thus putting in these connections as one traces them, the result when completed will be a diagram of the instrument, very rough, as shown in Fig. 3.

After having worked out the rough diagram, it is well to rearrange it, straightening out the wires and so placing them that they cross each other as few times as possible. A great point in diagrams is to have no part crowded, thus minimizing error in tracing a connection. The diagram of Fig. 3 is thus rearranged in Fig. 4.

A convenient way to make and keep diagrams is to use a loose leaf book 6 by 9½ inches, the paper being cross-sectioned about 1-6 inch apart. These books are invaluable for systematic work, as the leaves may be removed, re-arranged or replaced at will. The cross-section lines render free-hand work easy, so that no drafting instruments need be used even in diagrams for permanent record.

EDITOR'S NOTE.—This is the first of a series of articles by Messrs. Miller and Dean treating of telephone troubles. They will continue for about a year.

TELEPHONE CIRCUITS—ARTICLE III.

By H. P. CLAUSEN.

TOO many diagrams for operators switching keys are objectionable, as the forms generally used are fairly standard, and special features are of such a nature that it would be impossible to embody them in a predetermined diagram. Fig. 100 shows a two-way non-locking key, each movement of the key producing a circuit combination in which two selector springs each break a normally resting contact and close a normally open-front contact. In Fig. 101 one-half of the key shown by Fig. 100 has been retained, while the opposite combination of the key is arranged for what is known as a locking position; that is, to say, that

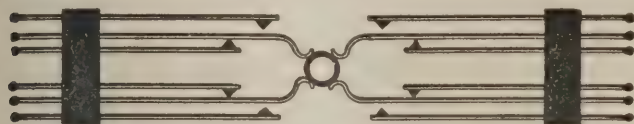


FIG. 100.

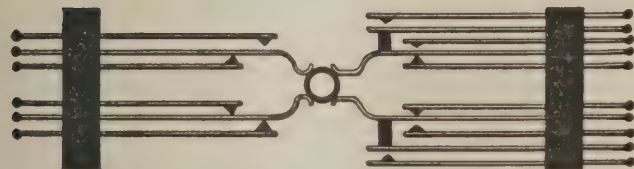


FIG. 101.

when the switching lever is drawn over it is held until returned to normal position by a manual operation of the operator. The spring combinations are more complicated, both selector springs opening back contacts, closing front contacts, and at the same

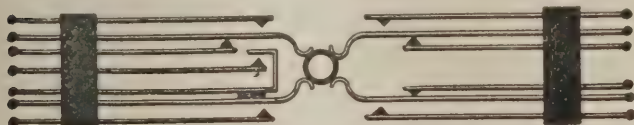


FIG. 102.

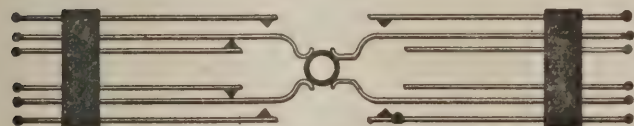


FIG. 103.

time controlling two auxiliary springs arranged for closing normally open contacts. The diagram is sufficiently clear to show the combinations of the different springs. The locking or non-locking feature of the key is indicated by flattening the ends of



FIG. 104.



FIG. 105.

the selector springs. Fig. 102 shows another form of non-locking key with a different arrangement of springs, while Fig. 103 shows

what is ordinarily known as a one-way ringing and listening key, with no back contacts on the listening side. Fig. 104 is a peculiar combination, but one much used in practice, in which



FIG. 106.

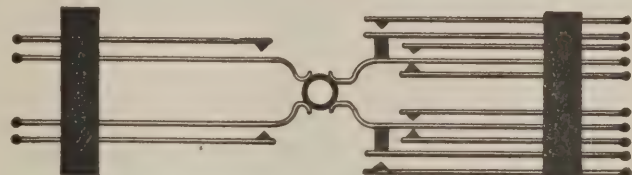


FIG. 107.

the key when operated is locked into position, but instead of operating only one-half of the springs, as in each of the preceding diagrams, the four selector springs are operated at one time, making and breaking the contacts as indicated. Fig. 105 is really a duplicate of the Fig. 103 combination, with the selector springs on the locking side arranged with back contacts; Fig. 106 is somewhat similar, but with a different arrangement of auxiliary springs. Fig. 107 shows a key combination similar to Fig. 101,

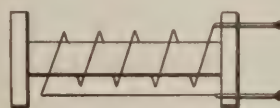


FIG. 108.

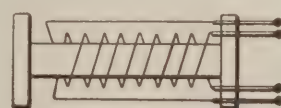


FIG. 109.

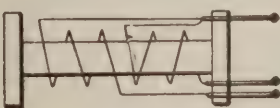


FIG. 110.



FIG. 111.



FIG. 112.



FIG. 113.



FIG. 114.



FIG. 115.

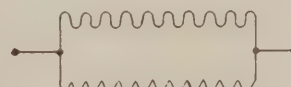


FIG. 116.

omitting the normally resting back contacts on the non-locking side.

The reader must not expect to see all circuit diagrams drawn to exactly follow the standards shown, for standards are simply an idea as to the probable shape of a certain piece of apparatus, while the circuit diagrams are the important subject,

and the apparatus diagrams must conform to the exigencies of each case.

RESISTANCE COILS.

The subject of impedance coils is naturally followed by that of resistance coils. Fig. 108 shows a simple resistance coil mounted

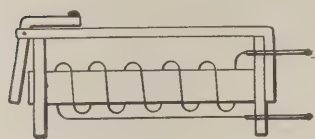


FIG. 117.

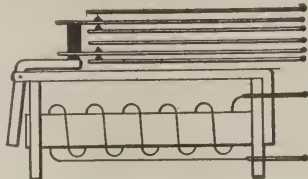


FIG. 118.



FIG. 119.



FIG. 120.



FIG. 121.



FIG. 122.

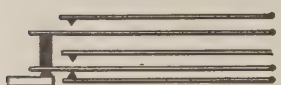


FIG. 123.

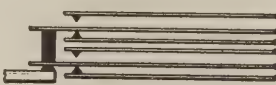


FIG. 124.



FIG. 125.



FIG. 126.

on a spool, while Fig. 109 is the same spool with parallel-wound coils brought out to separate connectors, permitting of inductive or non-inductive connection. In Fig. 110 an inner and outer end of the windings are connected to a single terminal, while the remaining ends have been brought out to separate connectors, showing a non-inductive construction by means of which a number of

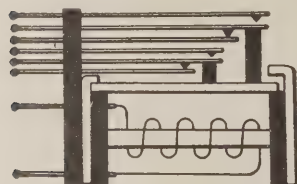


FIG. 127.

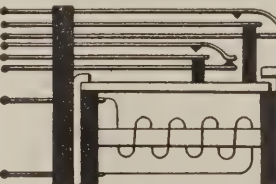


FIG. 128.

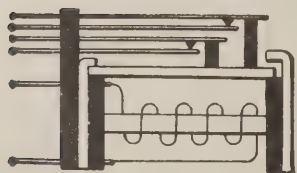


FIG. 129.

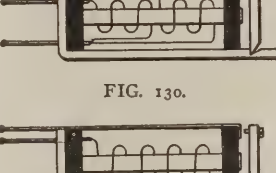


FIG. 130.

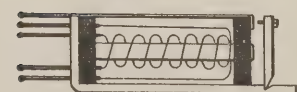


FIG. 132.

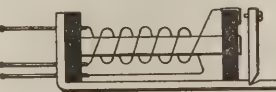


FIG. 131.

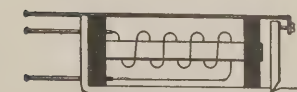


FIG. 134.

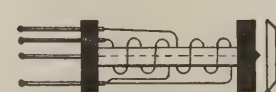


FIG. 133.

coils may be placed alongside of each other without producing cross-talk when used on different circuits. These diagrams in-

dicate the use of a spool constructed without an iron core. Fig. 111 could be used to illustrate a relay winding, for the inner winding is inductive and the outer winding non-inductive. Fig. 112 shows a simple zig-zag diagram similar to that of Fig. 99, without the intersecting lines, which convey the idea of impedance. Fig. 113 is a correct representation of a non-inductive-wound resistance coil, the winding returning upon itself. Fig. 114 is similar to Fig. 112, showing how a connection is taken from any portion of the winding—from the center or from one side. Fig. 115 shows a changeable resistance. The different contact blocks are shown connected to different portions of the coil, and these blocks may be connected to the opposite strip by a movable switching plug. Fig. 116 represents Fig. 111 in diagrammatic form and may be described as a non-inductive resistance connected in parallel with an inductive winding.

RELAYS.

Relays are difficult to treat owing to the large number of combinations to which this much-used piece of apparatus is susceptible. Fig. 117 gives a plain diagram, containing a correct representation of the mechanical and electrical features without any compli-

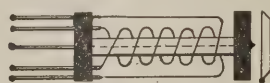


FIG. 136.

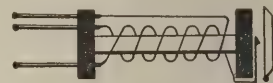


FIG. 137.

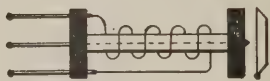


FIG. 138.

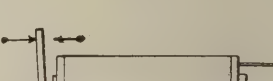


FIG. 139.

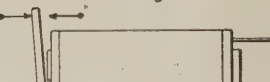


FIG. 140.

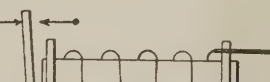


FIG. 141.

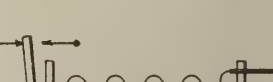
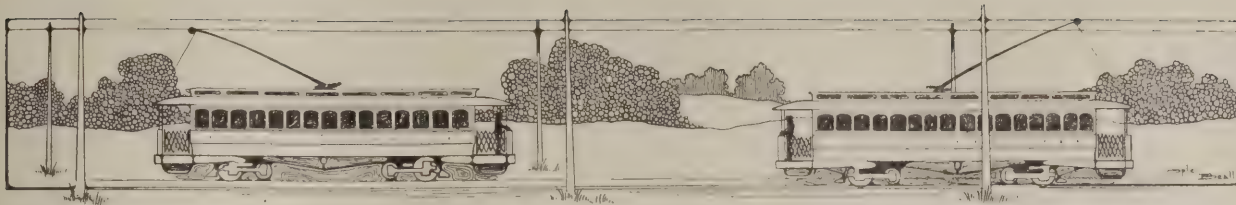


FIG. 142.

cated drawing. When the winding on the relay is traversed by a current the armature is attracted by the pole piece, and referring to Fig. 118 the two selector springs break their normally resting contacts and establish a connection with their front contact springs. To show this building up of springs more plainly Figs. 119, 120, 121, 122, 123 and 124 have been provided, while Fig. 125 is presented to show how many combinations may be built up without resorting to complicated diagrams or sacrificing ease in leading circuit connections. In this series of articles Fig. 126 will be largely used. It does not represent the actual mechanical construction of a relay, but serves as an easily understood and quickly made standard. Referring to Figs. 127, 128 and 129, a form of relay diagram is shown which has been largely adopted by the Bell Co. This construction is similar to that of the previous diagrams and may be used in the same manner. Diagrams 130 to 138, inclusive, show back contact or front contact combinations, with some variation in the windings; thus Fig. 130 shows a front contact relay with a double winding, Fig. 131 a single winding, and Fig. 132 a parallel winding, while Fig. 133 shows a double-wound relay with a winding which is cut in when the armature is drawn up. Fig. 134 represents a single-wound relay with the armature normally resting in contact, while Fig. 135 is a front-contact relay wound similarly to Fig. 130, but arranged so as to permit more ease in drawing; this is also true of Fig. 136, as compared with Fig. 132, while Figs. 137 and 138 represent different forms of Figs. 133 and 131. Figs. 139 and 140 show respectively a double and single coil relay, arranged with both front and back contacts, the armature serving as a selector. These relays are shown electrically more clearly by Figs. 141 and 142.

EDITOR'S NOTE.—The first article of this series appeared in the issue of Nov. 22. They will continue for many months.



DISPATCHING TROLLEY CARS BY TELEPHONE

The System of the Milwaukee Street Railway

By R. F. HOWARD

DISPATCHING cars of a gigantic street railway system by telephone. Five years ago if you had made such a suggestion to a street railway man he would have considered it as simply a flighty dream of a telephone enthusiast. To-day it is not only a possibility—it is a reality. Every enterprising street railway corporation that operates a good sized system, relies on the telephone as its most important adjunct. The telephone dispatches cars on their proper time, it keeps them so far as is physically possible on schedule; it reports breakdowns; wrecks, fires, accidents, it enables the officials of the company to keep in instant and constant touch with every car and every employee; it is used to transact all the detail and routine work of the corporation. It has made the telegraph, and every other form of dispatching and operating, obsolete.

Within the past five years, experiments with the telephone for dispatching have been made and have been uniformly satisfactory. The telephone is no longer an experiment; it has solved the problem.

A representative telephone dispatching and commercial system has been installed by the Milwaukee Electric Railway and Light Company. This company operates in Milwaukee one of the most thoroughly equipped street railway systems in the United States and there is scarcely a point within the corporation limits that cannot be reached within less than two squares by car lines from the business center.

Upon these lines city cars are run at headways of four to six minutes, and the tracks are used within the city limits by interurban lines so that all cars are run through the business center over the same rails, reducing the headway in some instances to one minute. The difficulties of keeping the car traffic from becoming congested are therefore apparent.

In addition there are three navigable rivers through the city equipped with bridges which must be opened for passage of vessels, and there are dozens of steam railway crossings at which the cars are stopped indefinitely in answer to the behests of commerce.

The whole car system is operated from the company's main office building in Milwaukee, with a branch station at Racine, twenty-three miles south.

In the telephone office a commercial line board, a dispatching board and an intermediate board are installed. All lines to the



MOTORMAN RECEIVING ORDERS.

general offices, power houses, shops, residences of the officers of the company and other places where a telephone is desirable in the operation of the railway system, are terminated on the commercial line board. There are now 64 commercial telephones in

DISPATCHERS' SHEET, 44 INCHES WIDE, AND RULED TO SUIT REQUIREMENTS OF SYSTEM.

REPORT OF NORTH MILWAUKEE MOTORMEN				REPORT OF WAUWATOSA MOTORMEN				THE MILWAUKEE ELECTRIC RAILWAY AND LIGHT COMPANY.														DISPATCHER'S SHEET																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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Milwaukee and nine at Racine. The dispatching lines terminate on the dispatching board and are so distributed as to parallel the railway system. One hundred and eleven dispatching sets are for the Milwaukee system, and twelve for the branch system. These dispatching instruments are placed at every crossing and junction of the city lines and at every turn-out and junction of the inter-urban lines.

The commercial and intermediate boards are mounted side by side and consist of standard switchboards of the central energy visual signal type. The signals are mounted in the upper part of the cabinet protected by glass plates having alternate ground and clear glass strips. The visuals when not in operation are concealed behind ground glass, and appear in the clear glass when operated. The corresponding answering jacks are mounted in the panel below. The jacks are mounted in strips of ten, numbered to correspond with the visual. There is also associated with the commercial board a line pilot lamp which lights whenever a call comes in. The keyboard is wired for twelve pairs of connecting cords with double lamp supervisory signals, together with ringing and listening keys, and an operator's telephone equipment.

The intermediate board of the same type as the commercial board, has terminated thereon answering jacks and lamps multiplied with dispatching lines, which enables the commercial operator to connect dispatching lines and commercial lines together.

The operation of the commercial and intermediate boards is as follows: A call comes in on the commercial board from a party who has removed the receiver. The operator answers and on learning the number of the desired party uses a connecting plug and plugs into the jack of the called party's line and rings. The lamp associated with the answering cord remains out and the lamp associated with the calling cord remains lit until the called party answers. During conversation, both supervisory are out, and as soon as either party hangs up the corresponding lamps light, a signal for disconnection. If a call comes in on the dispatching board for a party connected with the commercial board, the operator plugs into the jack multiplied with the dispatching line mount-

ed immediately below the corresponding calling lamp and puts up the connection in the ordinary manner. If a call comes in on the commercial board for a dispatching line, the connection can be put up by the commercial operator. As but few of the dispatching lines are equipped with bells, this class of service is rarely required.

The dispatching board is a desk board and consists of two sections, each section having two operators' positions. The ultimate capacity of the dispatching board is eighty lines. The board is 12 feet long and provided with a tier of drawers at each end, and has mounted on top of the desk a cabinet for line signals protected by ground glass plates. Each position is wired for twenty dispatching lines, consisting of a visual signal, one ringing and listening key, and a transfer key for transferring calls to the intermediate board. The keys associated with each line are mounted so that an operator to answer a call need only press the listening key associated with the line calling.

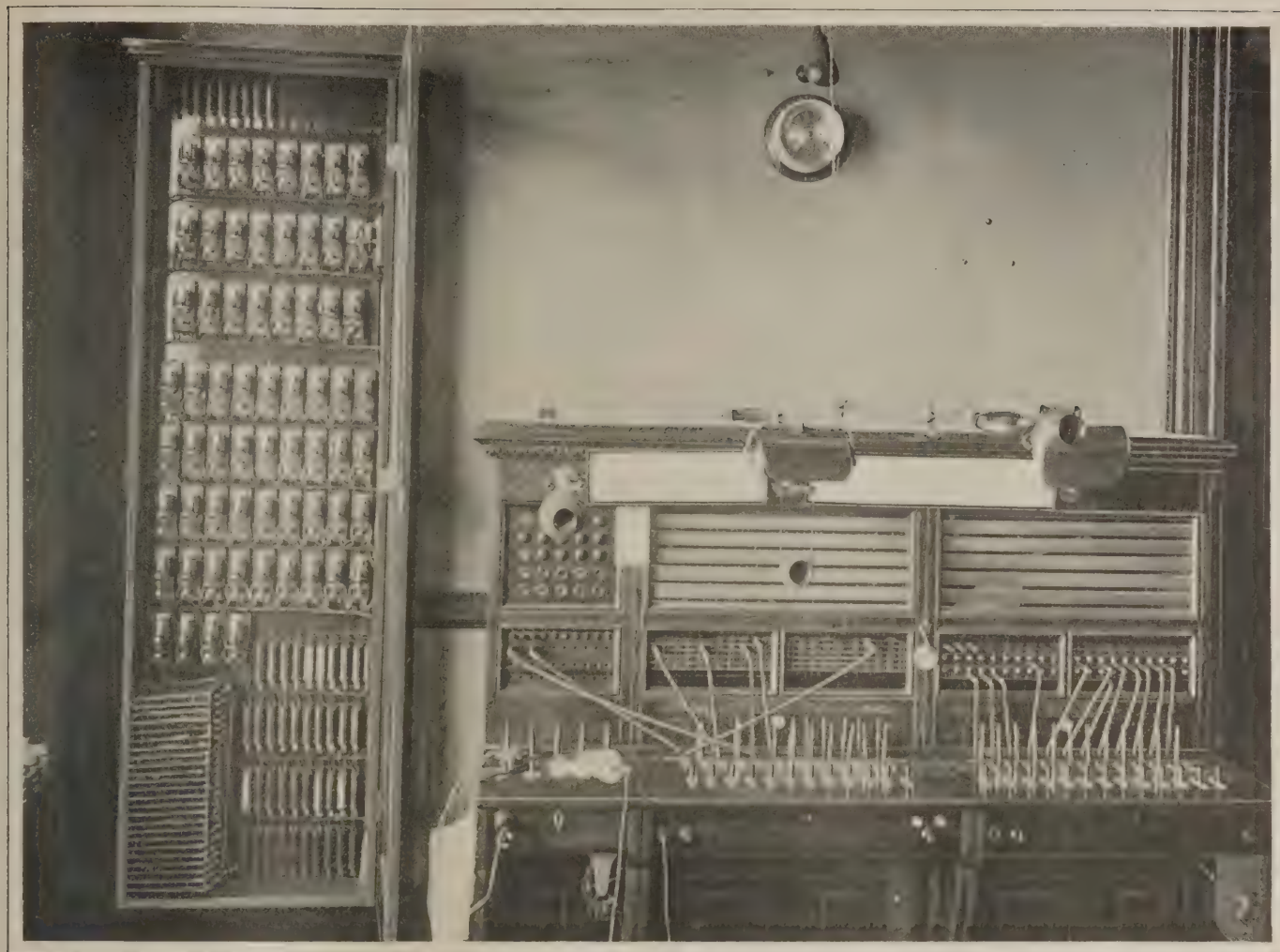
The operation of the dispatching board is as follows: A call is made by a motorman taking the receiver off the hook in the dispatching box, which operates a visual signal on the board. The dispatching operator pushes the listening key and puts himself in direct communication with the motorman. If the motorman desires connection with the power house or any line terminating on the commercial board, the dispatcher throws the transfer key, which lights a lamp in the intermediate board. Thereupon the commercial operator takes the call and puts up the connection.

The method of giving dispatching orders is entirely verbal. The motorman in every case repeats everything back to the dispatcher, and does not leave the telephone until he repeats the dispatchers "good-bye." A train sheet and daily record sheet is kept by the dispatcher, on which are the reporting time of all cars, the delays in transportation, the action thereon, and the state of the weather.

Three dispatchers are employed, each serving eight hours a day, and two commercial operators, each serving six hours a day. The night dispatcher answers the calls from both boards after 7 p. m.

STREET RAILWAY DISPATCHING SWITCHBOARD.





STREET RAILWAY COMMERCIAL SWITCHBOARD.

This is done by pushing all transfer keys on the dispatching board to the transfer position, thus throwing all lines on the intermediate board, the dispatcher thus being able to answer all calls from one position. The board at Racine is operated by the station clerks.

There is a complete power plant, consisting of two sets of storage batteries, each of 40 volts, and each having capacity to operate the system for 48 hours without recharging. There is a marbleized slate power board equipped with Weston voltmeter, double scale, 0 to 3 and 0 to 75, and two Weston flush type ammeters, for charge and discharge of the storage batteries. An underload circuit-breaker and necessary switches for the power plant and the starting boxes and rheostat for the charging motor generator and ringing dynamotors are also on the power board. The storage batteries are charged by a motor-generator, primary 220 volts, and secondary 60 volts. There are two Roth Bros.' ringing dynamotors, one to operate on a 220-volt D. C. power circuit, and the other for a 40-volt battery circuit. The secondary of each gives 100 volts alternating.

A combination lightning arrester and cross-connecting board has terminals for the various cables. The cross-connecting board is an oak cabinet provided with glass doors mounted so that the dispatcher can at any time replace the fuses.

The telephone circuits cover the entire railway system, requiring 600 miles of wire. The underground cables are No. 19 B. & S. gauge, twisted pairs, dry core type. There are approximately 50,000 feet installed. At the terminal poles there are combination fuse and lightning arresters to protect against foreign currents.

The overhead lines are of No. 12 B. & S. hard-drawn copper strung on the company's lighting and street railway poles. There are 300 miles of overhead wire. No brackets or knobs are used, the wires being strung on a double petticoat glass insulator mounted on a locust pin. There are transpositions where necessary to remove inductive disturbances. Each dispatching instrument consists of a solid back transmitter, bipolar receiver and in-

duction coil mounted in a waterproof iron box provided with a lock, a key for which is furnished each motorman. Each box is equipped with a pair of lightning arresters and fuse blocks, and a line switch for opening the circuits in case the dispatching set becomes defective.

The dispatching telephone is a complete central energy equipment, disconnected from the telephone circuit when the receiver is on the hook, and located at suitable points along the street railway line. No ringers are provided. In residences and power stations, wall type central energy telephone instruments are used, each instrument being protected by a fuse and lightning arrester. Desk telephones are used in the offices.

At prominent junctions and points where there is extra heavy traffic a four-inch call bell composed of a double polarized ringer and condenser is placed in a waterproof box. The bells are bridged across the dispatching lines and the dispatcher can ring them by moving the ringing key associated with each line. These ringers are used to call inspectors and station masters.

The telephone system is maintained by special inspectors. Emergency repair reels are used when a considerable amount of wire or poles is down. The reels have a thousand feet of twisted pair telephone wire, one end connected to binding-posts at the hub, the other being attached to a fiber block carrying two binding-posts. Reels are provided with a case carrying a telephone set and pair of pliers, so that interruption to telephone service is reduced to a minimum. Special promptness is required for the operation of the telephone lines on the interurban system.

The general operation of the system has shown itself to be entirely satisfactory in all respects. Great credit is due the manufacturers of the apparatus, the Stromberg-Carlson Telephone Manufacturing Company. The installation of the lines was under the immediate supervision of Fred G. Simmons, superintendent of construction and maintenance of way, of the Milwaukee Electric Railway and Light Company.

COST OF TELEPHONE TRAFFIC

By ARTHUR VAUGHAN ABBOTT, C. E.

AN important item in the annual expense of giving telephone service is the cost of traffic. It is that portion of the yearly cost which it is necessary to cover the expense of making subscribers connections, and which will change directly as the number of calls increases or diminishes. An analysis of this expense shows that it is divisible into four parts.

FIRST—LABOR EXPENSE.

The labor item is the salaries and wages paid for labor at the switchboard in making connections, and in supervising the operators. This item also embraces the cost of making and auditing tickets when measured service by that plan is offered. The cost of serving position at the switchboard is determinable only by experience. Rates paid vary greatly in different cities. B operators generally command higher prices than A operators; both classes receive better wages in larger cities than in small towns. Salaries for B operators in large cities vary from \$25.00 to \$35.00 per month. A operators receive from \$18 to \$25, while students and those who lack the experience of first class operators receive from \$12 to \$15. In medium sized cities rates are about 25 per cent. lower, while in the smaller towns students are rarely paid at all, and A operators receive but from \$14 to \$18 a month. For managers, chief operators and supervisors it is difficult to assign uniform rates, for salaries depend largely upon the special skill or ability of the individual. Averaging salaries from a number of different exchanges throughout the country, managers are paid from \$60 to \$100 per month, chief operators from \$50 to \$70, and monitors from \$40 to \$50.

The annual cost of B positions is slightly greater than that for A positions, because B operators usually receive somewhat higher salaries. The difference, however, is too small to be of essential magnitude. Analyzing returns from a number of exchanges large and small, the average show about 350 M calls for a position per annum in large cities, 300 M calls in small ones, 250 M calls in towns, and about 900 M originating calls per B positions. The costs for labor per position and per M calls are shown in Tables I, II and III.

TABLE I.—OPERATING COST IN LARGE CITIES.

	Per Position.	Per M Calls.
Operators' salaries.	\$500.00	\$1.57
Salaries of executive officers and supervisors.	200.00	.62
Rent, light and heat.	75.00	.23
Incidentals.	25.00	.08
Total.	\$800.00	\$2.50

TABLE II.—OPERATING COST IN SMALL CITIES.

	Per Position.	Per M Calls.
Salaries of operators.	\$450.00	\$1.50
Salaries of executive officers and supervisors.	120.00	.40
Rent, light and heat.	70.00	.22
Incidentals.	10.00	.03
Total.	\$650.00	\$2.15

TABLE III.—OPERATING COST IN SMALL TOWNS.

	Per Position.	Per M Calls.
Salaries of operators.	\$320.00	\$1.28
Salaries of executive officers.	140.00	.56
Rent, light and heat.	110.00	.44
Incidentals.	5.00	.02
Total.	\$575.00	\$2.30

In a similar manner the cost of labor to handle trunk calls is found to average about 84 cents per M calls in large cities, and 95 cents in smaller ones.

SECOND—PLANT EXPENSE.

This is the annual expense (maintenance and depreciation) of that part of the central station apparatus and wire plant which depends upon traffic only. It is easy to see that there is a portion of every telephone plant which is independent of the amount of business transacted by subscribers. Thus, the sub-station instru-

ment and the subscriber's line, the necessary answering jack and signal, the terminals on the main and intermediate distributing board are required whether the subscriber makes one or a hundred calls a day. But the trunk line plant is dependent upon the amount of traffic. If subscribers originate a large number of calls, many trunk lines will be needed, while if there are but few messages, a small number will suffice. The cost of multiple jacks is dependent upon the amount of traffic. If an A operator can handle 1,600 calls a day, the number of subscribers which it is possible for one operator to serve will depend only upon the number of originating calls made. If each subscriber makes 1,600 calls per day, one operator for every subscriber would be needed, contrariwise, if each subscriber should make but one call a day, each operator could care for 1,600 subscribers. In the first instance the cost of the A operators position, switchboard frame, cord shelf, listening and ringing keys, multiple jacks, etc., would be chargeable to the traffic of one line. In the second case, the cost would be divided between the traffic of 1,600 lines.

The ability to handle 1,600 calls per day means approximately 500,000 per year or 500 M calls. The cost of an A position on a modern multiple board, of say 2,000 lines, for multiple jacks, cords, plugs, frame, etc. excluding all subscriber's line apparatus is about \$700. Assume maintenance and depreciation at 15 per cent., then the annual apparatus cost is \$105. As the position rate is 500 M calls per annum the least traffic cost will be 21 cents per M calls. Suppose that the traffic on each line in front

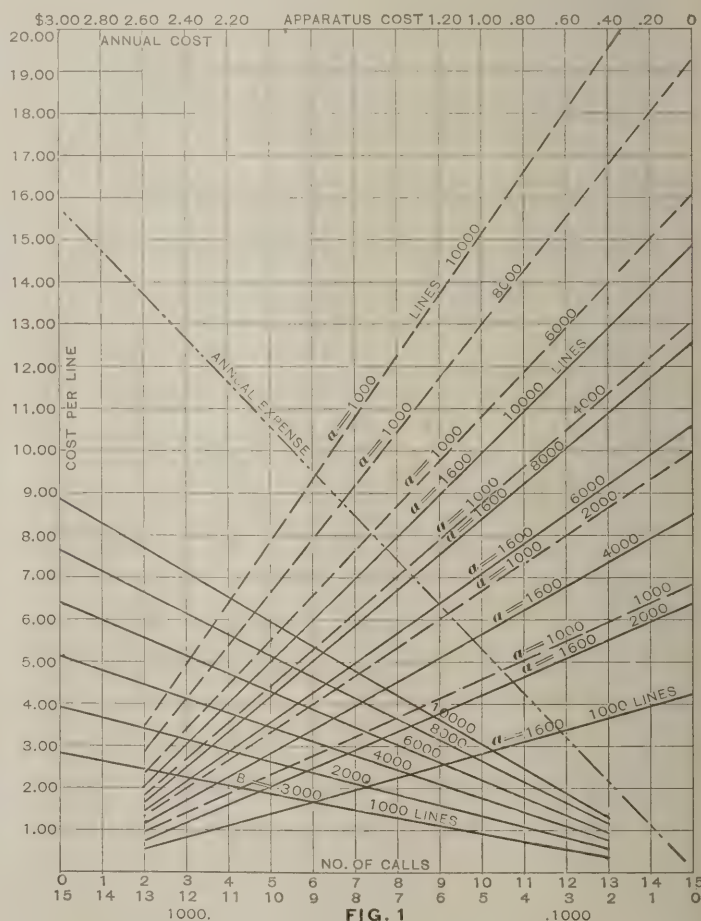


FIG. 1

of the hypothetical operator under consideration be doubled. The position would then receive 3,200 per day; but it requires two operators to care for this traffic, hence a new position must be installed and half the subscriber line apparatus moved from the

old one to the new one. Line cost is not changed, but the cost of all the other position apparatus is doubled, but as the traffic is doubled the annual expense per M calls remains constant.

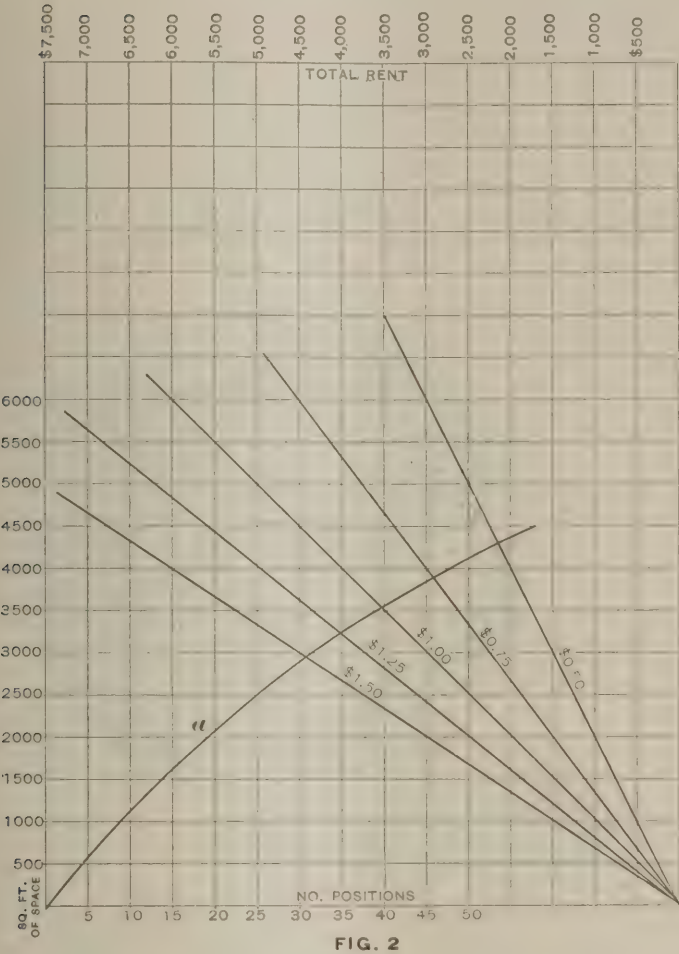


FIG. 2

Similarly the cost of B operator's equipment depends upon the amount of traffic. If there is no trunking there will be no expense for trunk lines, or for B operator's positions, but where there is more than one office in an exchange the number of B operators, and the cost of their equipment, will be directly proportioned to the traffic.

In Fig. 1 a table is given from which the annual cost of central station apparatus chargeable to traffic may be approximately ascertained. On the bottom of the sheet there are three scales all headed *number of calls*. The two upper scales read respectively from left to right, and from right to left, from 0 to 15. The highest scale applies to the full line and dotted line curve, on the left hand of the sheet marked "*a* = 1,000," and "*a* = 1,600." The second scale applies to the full line curves marked "*B* = 3,000" radiating from the right hand corner of the sheet. The first two scales are "calls per station" and the scale on the left hand "cost per line" in dollars. There are six full line curves showing the traffic expense for A positions for switchboards from 1,000 to 10,000 lines, with A operator rate of work at 1,600 calls per day, and six dotted curves for the same size of switchboard, but with the operator rate at 1,000 calls per day. Example:—To find the traffic cost of apparatus at five calls per station per day, A rate 1,000, for a 5,000-line switchboard—from 5 on the top scale of calls follow a vertical up to the full line headed "*a* = 1,600," 6,000 lines, thence a horizontal to the left hand scale finding \$3.50. This is traffic investment for a line doing a daily business of 5 calls. To find the investment per M calls in this example follow a vertical from 1,000 on the *lower* scale to the same curve, finding \$2.15 on the left hand scale. For any other size of board, or A rate of work of 1,000 calls per day, use the curve marked with the

desired size of board and rate. The investment in B apparatus is found in exactly the same manner by using the curves marked B radiating from the right hand side of the sheet. Only one rate of work is given viz: 3,000 messages per position per day. Total traffic investment where both A and B boards exist is found by adding the individual investment for each board. To find the annual expense per M calls for A or B position, follow a vertical from 1,000 to the curve of desired size of board and rate of work therein a horizontal to the line headed *annual expense* thence a vertical to the top of the sheet headed *annual cost*.

The investment and consequently annual expense in trunk line wire plant is difficult to show because of the great variation in the length of trunk lines. Evidently the cost of this part of the wire plant will be proportional to the traffic, the number of calls a trunk line can carry per unit of time, and the length of the lines needed to reach the various offices. Experience has shown that the trunk traffic will be from 65 per cent. to 80 per cent. of the originating calls, and that a trunk line can handle from 110 to 150 messages per day; but there is no uniform experience of trunk mileage between offices. It is possible to express the traffic cost per M calls per mile of wire, from which coefficient the traffic cost of any given plant for trunk lines can be at once calculated. To handle 500 M originating calls per year will need ten trunk lines and say one call circuit or eleven lines. At \$60 per pair mile (including conduit expense) this plant is worth \$660 or \$1.32 per M call per trunk mile, and the annual charges are in round numbers 20 cents per M calls per trunk line mile.

THIRD—RENT, LIGHT AND HEAT EXPENSE.

The amount of space necessary in any operating room will be very closely, though not exactly directly proportional to the number of operators, and as the number of operators has been shown to vary with the traffic, a large portion of *rent, light and heat* expense of the operating room and operator's quarters is chargeable to traffic. By finding the amount of floor space allowed, in a well managed office, per position for switchboards of various size, and the prevailing rates per square foot of floor area for suitable building for telephone offices, the traffic expense due to rent is easily ascertained. In Fig. 2 the curve *a* indicates the relation between number of positions and necessary floor space, including that needed for lunch rooms, operator's quarters, etc. The lower scale gives the number of positions, while the left hand one is the required area in square feet. Rent, light and heat is found to vary from 50 cents per square foot in small towns in new fireproof buildings to \$1.50 per square foot in the best buildings in large cities. On the right of Fig. 2 five curves are shown for varying rates of rent, the scale for this purpose being at the top of the sheet. Thus for an exchange of twenty-five positions follow a vertical line from 25 on the lower scale to the curve *a*, thence a horizontal to the left finding 2,500 as the required floor space in square feet. If the rent is \$1 per square foot follow from curve *a*, a horizontal to the right till the line headed \$1 is reached, thence a vertical to the top of the sheet finding under *Total Rent* \$2,500 as the annual expense for this item. Assuming twenty-two of the twenty-five positions to be active at a rate of 1,600 calls per day, the traffic expense due to rent would be 22.87 cents per M calls.

FOURTH—GENERAL EXPENSE.

Finally there is a collection of certain items, such as that fraction of the entire management expense of the company chargeable to traffic; janitor service, etc., that form a kind of skeleton expense, which can only be classed under the title of *General Expense* or *Incidentals*, and which varies so slowly with changes in the amount of traffic that it may almost be called a fixed charge.

TABLE IV.—COST OF TRAFFIC PER M CALLS.			
	Large City.	Small City.	Town.
A operators.	\$2.50	\$2.15	\$2.30
B operators.	.84	.95	—
Switchboard expense. .	.70 to 1.00	.50 to .75	.25
Trunk line.	.15 to .50	.10 to .30	—
Total.	\$4.19 to \$4.85	\$3.70 to \$4.15	\$2.55

Summarizing the various items thus found, the total cost of "traffic" is shown in Table IV.

THE RUSSIAN ARMY TELEPHONE

By KLAS WEMAN

THE Signal Corps of the Russian Army uses a telephone which has a very peculiar shape. The accompanying cuts give an idea of its appearance. It is simply a large, flat receiver, and it serves both as receiver and transmitter, for talking and for signaling as well.

The tube extending from the middle of the instrument is a detachable reed, fastened to the instrument by a small chain. The handle constitutes the magnets, and these are movable in sockets in the pole pieces. By turning them over to either side and also taking out the reed tube, the apparatus takes up very little space in the leather case in which it is carried slung over the shoulder by means of a strap.

The cores of the electro magnets are laminated, and the spools are very large. The bottom shell is made of heavy brass and ground square at the top where the diaphragm rests. The cap is of hardwood and is screwed on to the shell by five screws passing through a brass ring, thus keeping the heavy diaphragm firmly in place.

The arrangement for adjusting the distance between the diaphragm and the magnet cores is very ingenious. The pole pieces are fastened to a brass tube on the outside of which there is a very fine thread, and this brass tube is screwed into the shell. By holding the receiver firmly and turning the handles, or vice versa, the magnets may be brought up to any desired distance from the diaphragm. On the brass tube, there is a threaded ring acting as a set-nut. From the inner periphery of this ring, a slot is cut slanting to a hole in the middle of the ring, thus leaving a tongue on the inner side. From the outside and through the outer part of the ring, is a screw which, when tightened, presses the tongue

pole pieces from coming closer to the diaphragm. Then the screw is tightened and the adjustment now remains permanent until the screw is loosened and the ring turned back.

The reed tube is made of brass and has at the end a mouth-piece of hard rubber. When it is blown into a thin metal tongue is caused to vibrate and gives a loud sound. At the lower end of the tube there is a pin having a large head. When the reed is placed on the receiver and the latter is held horizontally, which is the position for signaling, the head of the pin rests on the dia-



FRONT VIEW OF TELEPHONE.

phragm, and has a free movement vertically. The sound of the metal tongue causes the diaphragm to vibrate violently and the heavy pin, by its inertia not being able to follow the vibrations, increases the noise. If now a similar receiver is connected to the other end of the line and is held horizontally with the reed in its place, the vibrations from the sending instrument are transmitted to the receiving instrument, and here, through the inertia of the pin, the noise is also increased. As soon as the signal has been given and answered in a similar way, the reeds are taken out and the instruments are used as transmitter and receiver alternately.

Each soldier carries with him in the leather case, the apparatus and an extra diaphragm. He has also a coil of thin insulated iron wire. For grounding the other side of the instrument, he uses his bayonet or his sabre, by driving it in the ground and connecting the return wire to it.

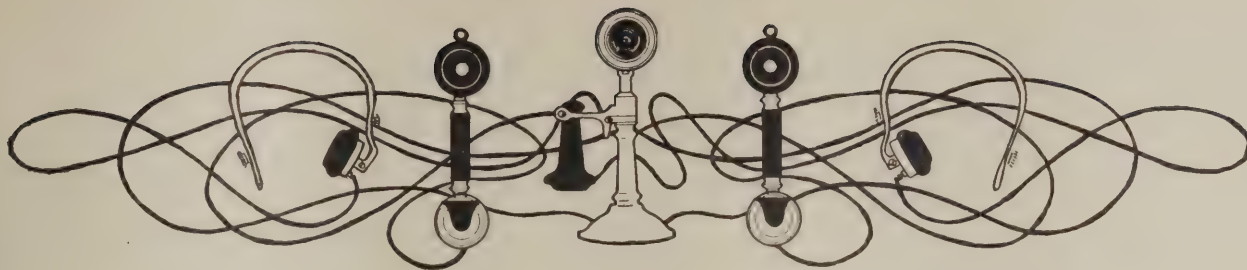
Each instrument is tested very carefully before it is accepted, and the testing is done in a very peculiar way. The two terminals of a coil are connected to a Deprez D'Arsonval galvanometer. Then the receiver is placed horizontally with the diaphragm upwards under a sort of scaffold. From this a weight is suspended over a pulley. The galvanometer is adjusted to zero on the scale, and then the weight is placed on the diaphragm. When the weight is suddenly pulled up, the deflection on the scale must at least reach 50°, and every receiver that can not be adjusted to this point is rejected.

This instrument was formerly used also in the German Army, but they are now using more complicated instruments. Every attempt to introduce more modern and complicated sets in the Russian Army has been unsuccessful. The Signal Corps invariably answers that this is an instrument that is hard to break, simple to understand and handle, for the average Russian soldier. The new instruments may be better, but if one should get out of order on the field, there is no one near to repair it.



ON GROUND, READY TO RECEIVE CALLING SIGNAL.

on the inside toward the thread on the tube. This acts as a brake, and the ring can not be turned. When the desired adjustment has been obtained by turning the pole pieces backwards or forwards, the ring is tightened up to the shell which prevents the



SOME STEPS IN THE EVOLUTION OF SWITCHBOARD CIRCUITS. ARTICLE II. THE SERIES GROUNDED CIRCUIT

By J. C. KELSEY

PRECEDING the advent of the street railway, the earth was used as a return, with no evil effects, so the switchboard naturally used the earth as a common return, thereby making all circuits of the single wire order.

One terminal of the subscriber's instrument was connected to the earth, while the other was connected to the exchange line, and entered the exchange as shown in Fig. 7. Disregarding the arrester and the terminal frames, the line entered the line spring

the operator in ringing would throw the drop and cause useless labor in restoring. If the board were of the multiple type, then ringing on a line would throw the drop of that line in front of the answering operator, as well as calling the subscriber, which would cause endless confusion. So in a properly arranged telephone system the act of plugging in any jack in the board will cut off the line drop. In local battery systems the act of cutting off the line drop does not give the subscriber any violent "click in the ear," as in some of the common battery systems.

As the list of subscribers grows more positions become necessary. On account of the size of the drops only seventy-five to one hundred can be placed in one position, and, besides, that number of lines is all that one operator can reasonably handle. If an exchange had but two hundred lines, then two operators in two positions could conveniently attend all subscribers by reaching each others' answering jacks, and no transfer trunks nor multiple jacks would be necessary.

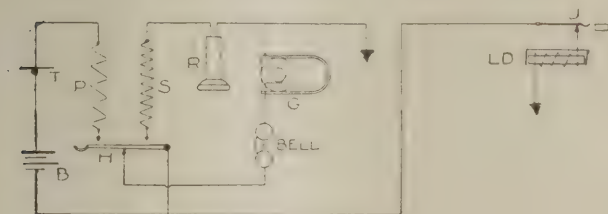


FIG. 7.

of the jack J, passed through the contacts to the spring underneath, thence to the drop D, and to the earth, completing the circuit. The main jack spring is a movable one, and is lifted from its contact with the lower immovable spring by the plug.

There are several potent reasons for cutting off the line drop during conversation, and through all designs of the latest switchboards one of the most important operations is the proper removal of the line signal. A simple turn of the generator handle G gives an impulse to drop L D, which raises the clutch, allows the shutter to fall, and attracts the attention of the operator. The insertion of the answering plug separates the jack springs and cuts off the low resistance drop 80 ohms, which, if left on the line,

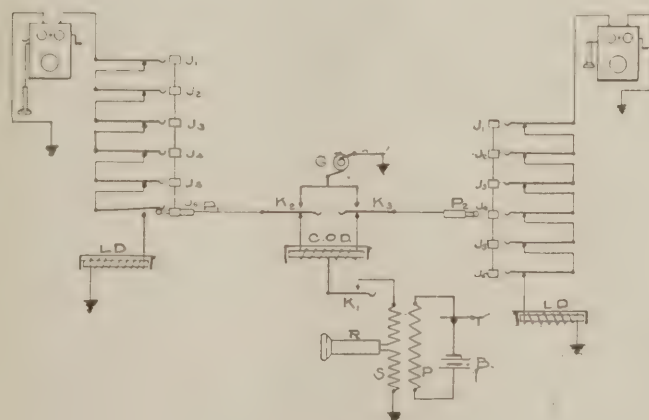


FIG. 9.

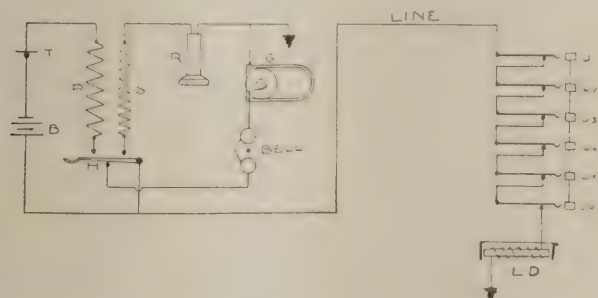


FIG. 8.

would cut down transmission by virtually short-circuiting the conversation. If the line drop remained across the talking circuit, not only would there be an injurious short-circuiting of voice currents, but a confusion of clearing signals, which would add useless work to operating. If it were not for the cut-off jack

But consider an exchange of one thousand lines. This would require ten operators' positions. Such a board would be about thirty feet long. It is impossible for all operators to reach each others' answering jacks, so for each position there will be eight operators, who are out of reach, and each section is able to handle only whatever business originates in its particular vicinity. To overcome this difficulty the jacks must be reproduced in each section of the board, so that, in reach of every pair of operators, every line is terminated in a jack, and any operator may reach any subscriber without the intermediate services of another operator. A thousand-line board must have five sections and five multiple or calling jacks, besides the original answering jacks, all arranged so that the act of plugging in any of the jacks will cut off the line signal. This is shown in Fig. 8. The jack springs are connected in series-multiple, while the sleeves or thimbles are connected in straight multiple. Let J^1 be the multiple jack belonging to section 1; J^2 be the jack in reach of section 2, and so on respectively. J^0 will be the answering jack belonging to what-

EDITOR'S NOTE.—The first of these articles appeared last week. They will continue for many months.

ever position the line number entitles it to. If the line number is 589, then J^6 will belong to operator 6, and will be under section 3. If operator No. 6 plugged into J^8 of line 589, she would mechanically cut off the line signal, just as readily as though she had plugged into J^6 , her own answering jack. Ordinarily, operators are forbidden to call parties in their answering jacks. If the line number was 50, then the answering jack would be placed in section No. 1 and J^1 would also be in section No. 1. At night,

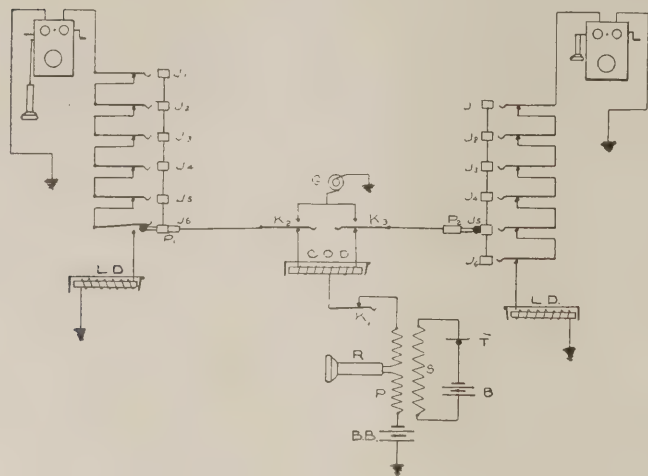


FIG. 10.

if No. 50 calls, the drop falls in section 1, and if perchance the operator is sitting at position 6, or in section 3, she does not have to answer No. 50 in position 1; she can answer just as readily in section 3. But she will have to restore the drop by some manual method. The time lost in restoring drops by hand led to the adoption of a self-restoring drop system, which is a succeeding step in the design of switchboards.

The cord circuit of this system was designed as a grounded circuit. It had a series clearing-out drop, so arranged as to enable the operator to ring on either answering or calling cords, to listen or converse with the subscriber, and receive a reliable clearing-out signal and an accurate busy test, as shown in Fig. 9.

Let P^2 and P^1 be the calling and answering cords and plugs, respectively; K^1 the listening key, K^2 the ringing key of the answering cord and plug, and K^3 the ringing key of the calling cord and plug. G is the ringing generator, with the earth as one terminal, and $C O D$ the clearing-out drop, with the middle point of the winding brought out. $S R$ and E are the induction coil secondary, receiver and earth respectively, which completes the listening set. $P B$ and T are the induction coil primary, transmitter and battery of the talking set.

No. 50 calls, ringing down his line drop $L D$. Operator 1 plugs in J^6 , cutting off the line drop. She then presses the cam handle of K^1 , and puts her listening set in series with the subscriber's set, saying "Number please?" Hearing the number, she inserts the calling plug into the desired jack, presses the cam handle of key K^3 , which closes the generator circuit through the desired subscribers' bells. When either party rings off, at the conclusion of the conversation, the clearing-out drop is excited, and the shutter falls. The operator seeing this, closes key K^1 , and verifies the signal by repeating, "Number please?" If she gets no response, she pulls down the connection. The act of closing K^1 causes the listening key to be bridged across the line in this case, while before it was in series. In the event of the subscriber calling, and hanging up his receiver before the called party answers, the operator has but to press the cam handle of K^2 , and call him back again. But late operating rules do not admit of calling back a subscriber, and recent boards have dispensed with the double ringing key.

So far this circuit is useless for multiple board service, because it has no busy test. Were it not for this busy test, multiple boards would be useless. There would be endless confusion, and what is more serious, double connections. It is very essential then, that a busy system be used, which will not allow a false test or give evidence to the subscriber that his line is being tested, and the best practice prevents any subscriber from hearing the test.

This series system depends upon the subscribers' ground for the busy test, and it is plain that if a person has the receiver at his ear, he will hear the same click which the operator hears upon touching the sleeve of a busy jack.

Fig. 10 shows the same cord circuit as Fig. 9, with the addition of a six or eight-volt battery $B B$, between the operators listening set and the ground. Fig. 10 shows the operator in the act of testing an unoccupied line. She touches the tip of the calling plug to the sleeve of the desired jack, two or three times in succession, hearing no click, because the sleeves are not in contact with any grounded connection, and as her plug has a higher potential than the earth, no current flows through the receiver. In this system, a subscriber could tell very plainly when the operator broke in on a connection, by the click in the receiver caused by battery flowing from the operators set to the grounds at the subscribers' stations.

Fig. 11 shows the operator testing a line, which is busy. As in Fig. 10, she touches the tip of the calling plug to the sleeve of the desired jack. In this case, she gets a very audible clicking every time she touches the tip of the plug. The reason for this is that some other plug has been inserted in the line and has charged the jack sleeves to the potential of the earth by short-circuiting the tip and the sleeve of the jack. Fig. 11 shows the jack J^1 , with a plug inserted. The sleeves of the six jacks being bound together have the same potential, and the act of touching the tip of any plug, with the listening key open, will cause a current to flow through the operator's receiver for an instant, and through the two busy subscribers' receivers also, thence to the earth. The call-

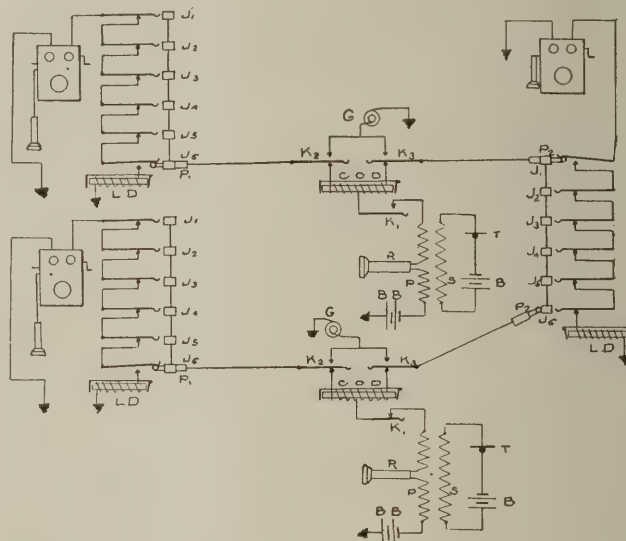
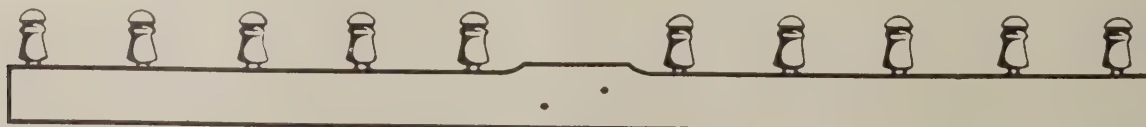


FIG. 11.

ing subscriber also hears the "busy," and if he is wise, will hang up without being told to do so. In this system, if a line had a potential of six or eight volts, due to earth currents, between the ground at the subscribers' station and that at the exchange ground, the busy test would be rendered useless. This system will not work satisfactorily where earth currents abound.



“DOWN IN A COAL MINE”

The System of the Phila. & Reading Coal and Iron Company

By C. M. LEWIS

TO operate a mining plant by telephone is certainly a novelty in this art of novelties, but on reflection there seem to be few places, wherein a telephone system could be of more value in the transaction of daily business, nor any situation

of greater value. Realizing the possible advantages that might accrue from improved methods of communication, the Philadelphia & Reading Railway Company, operating the largest portion of the anthracite regions of Pennsylvania, has recently installed a complete telephonic system connecting its general office in Pottsville, with all of the collieries in Schuylkill and Northumberland counties. This improvement was undertaken and carried to a successful completion by the Electrical Bureau of the Telegraph Department of the company.

The mining territory of the Philadelphia & Reading is di-

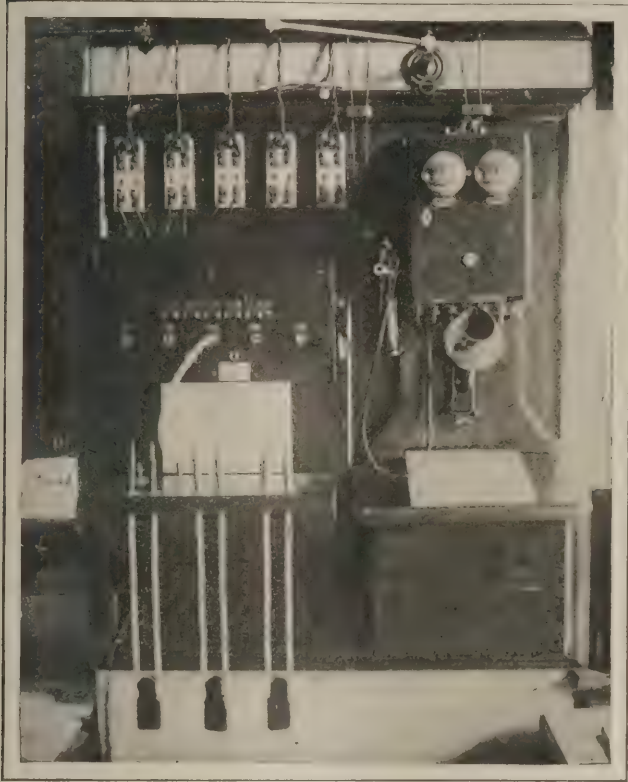


FIG. 3.—MINE SWITCHBOARD.

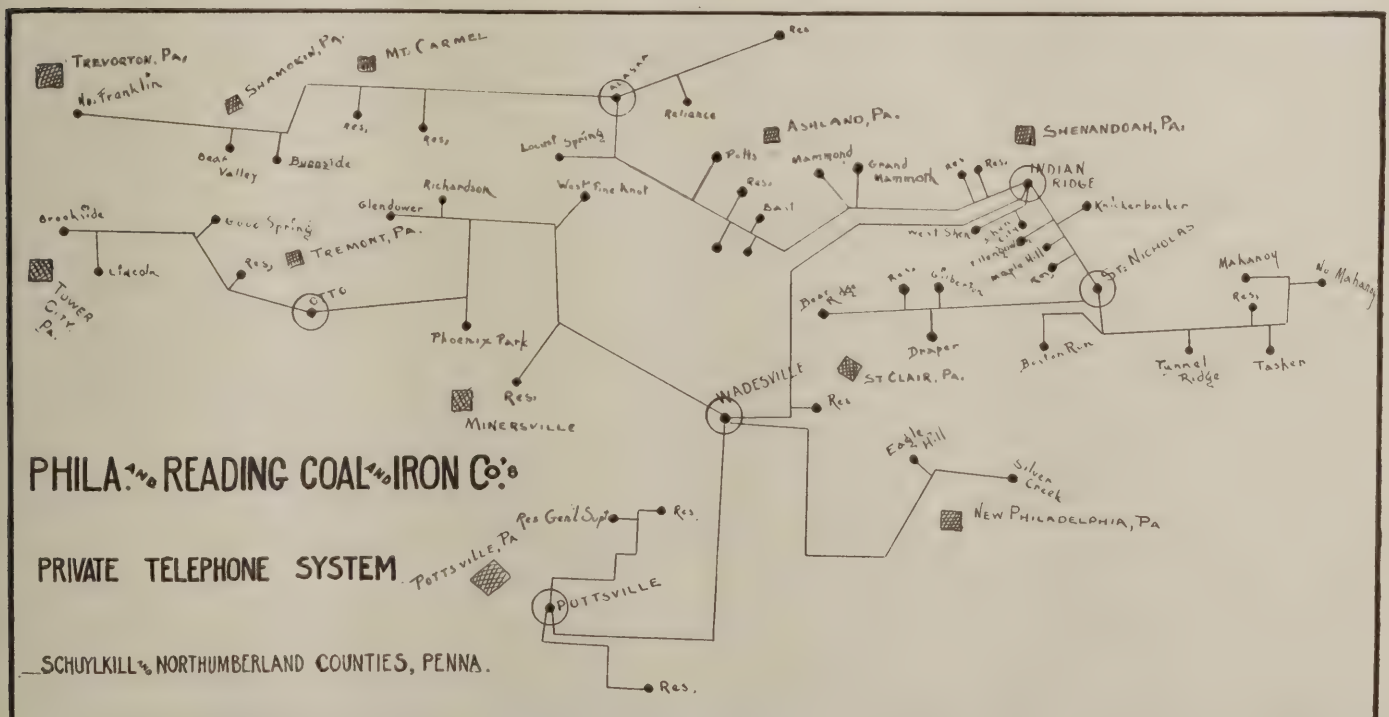
imaginable wherein due to the constant peril to life and limb, the quickest and surest means of intercommunication could be



FIG. 2.—BROOKSIDE BREAKER.

vided into a number of districts, each one of which is supervised by a district superintendent. Figure 1 gives a general plan of the districts which have been covered by the trunk lines of the telephone system, the circles representing the cross connecting points, from which lines extend to foreign districts. The system embraces all the collieries and washeries and the residences of all the district superintendents. These have been placed on a single line as shown in the plan, both ends of which terminate

FIG. 1.



in an exchange switchboard, from which service to other points in adjacent telephone systems is obtained.

Fig. 2 represents a single colliery showing the Brookside Mine with its breaker and washery, from which a general idea of the difficulty of constructing a telephone system, running from open air lines into the depth of a coal mine may be faintly realized.

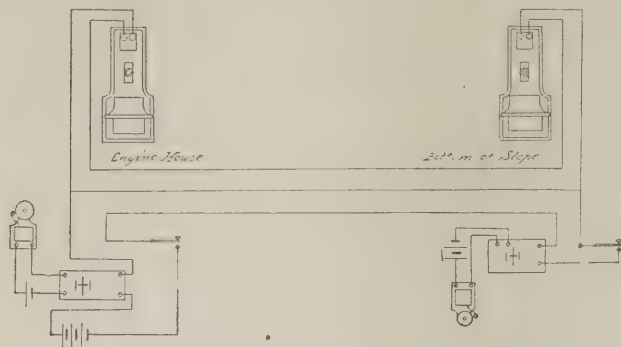


FIG. 4.

At each colliery there is an individual switching arrangement, consisting of a switchboard (Fig. 3) into which the various lines are extended and there equipped with jacks and drops. In a local circuit is an alarm bell, so that the falling of a shutter immediately causes the bell to ring, thus giving an audible as well as visible signal. The ordinary operator's telephone is replaced by a standard wall set, as shown upon the right hand side of the illustration; the lines as they enter the board are carried through protectors, containing both high and low potential arresters. Diagrams of the circuits are shown in Figs. 4 and 5, which are so plain as to be self explanatory.

The operation of this system is very similar to that of a regular telephone exchange, excepting that the telephone operator at each station acts in addition as a telegraph operator. A special feature consists in so arranging the circuits that at night, and on holidays, all the lines may be plugged together on each of the local boards and thus extended to the residence of the general superintendent. By this means the entire territory can be instantly placed in connection with the general superintendent. In the design of this system great care was exercised to thoroughly inspect and test apparatus from various manufacturers, and select only that which proved itself particularly practicable to the service demanded of it. All apparatus was tested upon an ar-

tificial line equivalent to 140 lines of aerial wire. This inspection resulted in the adoption of generators and ringers manufactured by the Connecticut Telephone & Electric Co., the transmitters, jacks, drops, plugs and switchboard apparatus of the Kellogg Switchboard & Supply Company with cords and receivers by Bay Couch & Seely. Gordon batteries are used.

The circuits shown in Figs. 4 and 5 supplement the general telephone system, and are extended into nearly all the lines operated by the company. These circuits serve not only to transmit intelligence from the surface to the headings below, but are of particular value in case of accidents, as a simple touch on a key at the various stations will set the alarm bells ringing in the offices above ground. When it is considered that these circuits are run in the shafts of coal mines 1,500 or more feet below the surface, in unlighted tunnels, and in charge of and operated by men who are unfamiliar with electrical apparatus and its operation, the simplest and yet most reliable circuit is required. All lines are series and are operated upon closed battery circuit. This is a vital feature for in case of accident the circuit is opened and alarm is at once automatically sounded.

Particular attention had to be paid to line wire insulation; in the larger tunnels and along the surface bare wires on insulators

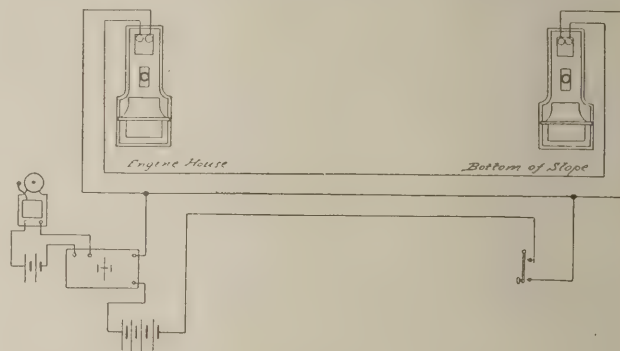


FIG. 5.

drawn very taut and frequently supported to clear all obstacles could be employed, but in the smaller drifts and bore holes only the best quality of twisted pair is used.

Experience with this system has demonstrated that it more than fulfills the somewhat sanguine expectations of its projectors, and adds another feature in the long list of situations in which the telephone becomes invaluable.

EXCHANGE AND TOLL LINE MAINTENANCE EXPENSE

BY REGINALD F. FENNELL

MAINTENANCE expenses on the plants of many telephone companies are often overlooked, the companies failing to appreciate the importance of allowing for maintenance in calculations of profits made on the investment or to provide a fund to take care of increased depreciation as years pass. Depreciation and maintenance (those expenses necessary to maintain a telephone exchange or toll line in the same physical condition as when originally constructed), five or seven years after the plant has been built, are higher than during the first, second or third year, and unless a reserve is set aside to meet this, basing the calculation on the same amount of business, the net returns must be in after years much reduced.

The desire of all Independent telephone companies to operate to the best advantage, to arrive at the true conditions as to what net profits are being derived from the investment, makes it necessary to correctly base the calculations for maintenance, reserve or depreciation charges.

A method of determining the financial success of a telephone exchange or toll line is, after paying all operating expenses and those incidental to the conduct of business, including the expenses of keeping the plant in good condition and repair, to

allow a percentage (say 5 per cent.) as a reserve or for maintenance account. The remainder, after this is done, should prove whether the investment is a success from a financial standpoint; that is, if the net amount, after these amounts have been deducted, is sufficient to pay a dividend on the amount of capital involved equal to what money is worth in that locality.

By putting aside a reserve or maintenance fund and using it to reduce the bonded or other indebtedness of the company or to increase its holdings, the financial condition of the company is continually being 'bettered.'

The importance of establishing a first-class exchange or toll line from the very beginning cannot be overrated or the advantage of maintaining it continually in good physical condition. By so doing expenses of operation are reduced and consequently the net returns increased.

Modern construction and apparatus tends to very materially decrease the cost of furnishing telephone service. These matters should be taken into consideration just as seriously in determining what rate should be charged for service in opening an exchange or toll line, as the cost of operating.



THE TELEPHONE IN FARM LIFE

By JOHN W. ANDREWS.

FARMERS are probably the most enthusiastic telephone users. To the resident of the rural sections the telephone means even more than it does to city dwellers. The latter have a splendidly organized postal service, distance-reducing, rapid transit electric systems; and they live almost next door to every other inhabitant in the city. Consequently even without the telephone they have not the sense of isolation, the feeling that they are cut off from all their fellow beings that the farmer experiences. Even with all these advantages over the farmer, the city dweller, almost without exception, has a telephone in his office or in his home. He finds it absolutely indispensable. It is a business getter. In many instances more business travels by way of the telephone than over all the other highways of commerce. There has been and still is a great demand for the telephone, and the men engaged in the telephone industry in this country are bending their energies to supplying this demand.

The least developed telephone field, however, is the rural or the agricultural sections of the country. Two reasons can be set down for the backwardness of telephone development in these places. The first and most important is to be found in the fact that up to the last four or five years farmers practically did not know what a telephone was. They depended entirely for communication on the slow-going mails or their own teams. The second reason was the fact that even had the farmers wanted telephone service they could not have had it. The Bell Telephone Company absolutely refused, time and time again, to give any telephone service to small cities much less so to a half dozen or more farmers scattered over wide sections of the country. There was no money in it said they. But then other men came into the telephone business, the men who are now known as the Independents, and their chief purpose in going into the business was to supply all those who wanted it with telephone facilities.

Thus, in the middle west, in the far west, in the east and even in the south, farmers know what telephones are and they are enjoying the privileges of talking to their friends, not to mention the business advantages secured from them.

While, comparatively speaking, the telephone development on farms is not great, yet taking into consideration the very short time the farmers have had telephones at all, this development is the most wonderful of the achievements of the telephone.

On the modern farm the telephone is a luxurious necessity. One could expatiate all day on the utility of farm telephones and yet not have told one-quarter. To the farmer the telephone is almost human. It is more to him than any other of the great inventions of the nineteenth century. It keeps him in close touch with his neighbors, the doings of his fellow farmers, with what is going on in the rural towns in his vicinity, with the news of the great cities of the world and the whole world's news. It is a barometer to him for by it he receives the government weather

report. This alone annually saves the farmers of the country hundreds of thousands of dollars. Before attempting any of the ordinary duties connected with agricultural pursuits, the farmer nowadays first learns the weather predictions. If they be unfavorable he does not undertake any work that is liable to be ruined. Before selling his produce he calls up and learns the top market prices. If unfavorable, he is saved a trip to the nearest market and also much money. He can keep in touch with the market and as soon as it is favorable sell his produce.

A Kansas farmer's wife, living on an immense farm, remotely situated from all civilized life, recently made a note of how the telephone in their home was used on just one morning. It was a remarkable record, although only a fair sample of the every day use of their telephone.

Before breakfast the farmer discovered that some of his cattle had broken out of pasture and could not be found. He did not call his hands together, mount horses and scour the country. He was too up-to-date for such a time-wasting procedure. Instead he called up his neighbors by telephone and within five minutes had located the strays. It would probably have taken half a day to find them had he not had the telephone.

A few minutes later a couple of bushels of peaches, which had blown from the trees over night, were brought in and it was evident that they must be put up immediately, else they would spoil. The housewife discovered she did not have a sufficient supply of sugar. The nearest store was five miles away, but she annihilated this distance by simply calling up the storekeeper by telephone telling him her predicament and two hours later she had the sugar.

The farmer intended to put up hay that day. Before so doing, however, he telephoned to the post office where the government weather report was received daily by telegraph and asked what the weather indications were. He was told that storms were threatened. Consequently he did not cut his hay and thus avoided considerable loss.

Shortly afterwards the peaches again troubled the farmer's wife. She had forgotten a recipe which she wished to use. It required only two minutes, however, to telephone to her sister, three miles away. About a half hour later some cattle were driven along the road in front of the house and were noticed by the farmer. Ten minutes later his telephone bell jingled violently. A neighbor excitedly informed him that his cattle had been stolen the night before, in the next county. The description tallied exactly with those the farmer had seen. Within two hours the thieves had been captured and the owner notified where he could find his stock.

A few instances that have come to the writer's notice recently, will be given to show the wonderful development of the possibilities of farm telephone systems.

A farmer's telephone company at Lexington, Illinois, has lines running in all directions. In this one system alone 320 tele-

phones have connection. Connected with this system is what is known as the Fifer line. It has about 300 telephones. The South Chenoa line also connected, has 60 subscribers; the Prairie Hall line has 60; the Colfax line has 125. The latter connects with the Lexington system at two points. The postmaster at Lexington uses the telephone to notify subscribers when there is a registered letter for them. They can then meet the carrier and get their letter. For this service there is a very small charge. The Prairie Hall line charges non-subscribers ten cents a message and the Fife line, fifteen cents. Subscribers pay \$35 for their telephones besides an annual assessment of \$4. In addition to the 320 farmer telephones there are 125 city subscribers. The charge to these is \$1.25 a month.

Here is another instance that was mentioned recently to show a skeptic that farmer lines pay. A subscriber to a telephone line was in the coal and wood business. He submitted facts and figures showing that orders for wood which he had received by telephone during the coal famine of the recent strike had already paid for his service several times over. There are thousands of farmers in the country to-day who can give like figures.

Another instance of the development is taken from the State of Iowa where there are probably more telephones than in any other state. The farmers Mutual Telephone Company was admitted by votes of the citizens to Bloomfield, Ia. It has just recently completed its system. Radiating from its central office are hundreds

of farmer lines on each of which there are from ten to fifty subscribers.

Among the most important may be mentioned the following: The Grove Mutual connecting Bloomfield to Stiles and extending into the south and southeastern part of the county. It has three lines and twenty-eight telephones. The Young line extends east with two lines and also twenty-eight telephones. The Rayburn line northeast has only one line with fifteen telephones connected. It will soon have connection with Floris, there being only a half mile gap between that place and Bloomfield at present. The Standley line extends southwest and connects Savanna. It has but one wire at present but has three others under construction. It now has about twenty telephones connected and this number will probably be increased at least three-fold. The West Grove central system comprises three lines and on these are about sixty-five subscribers.

Drakesville has nine lines with twenty-five telephones to each line making a total of 225. Ash Grove has five lines with 125 telephones and connects Blakesburg and Ormanville. Bellknap has a central system of several lines and a large number of telephones.

In Davis county where all these lines are located there are at present over two hundred miles of farmers' lines in active operation. Farmers telephone lines are being developed to a like extent all over the country.

THE PRESERVATION OF TELEPHONE POLES

BY DR. HERMANN VON SCHRENK

ONE of the vital problems engaging the attention of those interested in the telephone industry, is the future supply of poles. In the early days of construction it was a comparatively easy matter to find all the poles necessary. Tall straight trees in abundance could be had in close proximity to the routes under construction, and that at low cost. With the gradual exhaustion of the timber supply these conditions have changed, and to-day we find a growing demand met by a growing scarcity of proper timber, coupled with increased cost. The telephone and telegraph constructor demands not only one tree for each pole, but a tree a certain diameter both above and at the butt, and it must be straight and possess certain strength requirements. Telephone poles have a certain length of life, depending on the kind of timber, on the location where the poles are set, and on the condition in which the timber is put into the ground, *i. e.*, whether it is dry, fall or summer cut, etc.

It may not be out of place to call attention to some considerations bearing upon the future supply of poles and to the question of preservation, two most intimately connected problems. If we look for a moment at the kinds of timber which have been used for poles, we will find that several factors determined the use of one or another kind. The trees had to be straight, of a certain size, and strength, and of as great durability as possible. The timber which came up to these requirements was usually the very best for other purposes likewise, and as long as there was a large supply on hand only the best was used. The chestnut, the different cedars, the white oak, were freely employed and still are to-day. Ignoring their other characteristics it was found that their lasting powers were sufficiently great to prevent any consideration as to increasing their length of life. To-day we have to meet the question as to whether the time has not come for seriously considering the possibility of making poles, for which high prices are being paid, last one or two more years longer than they now do. If we assume that a chestnut pole set to-day can be made to last a number of years longer at a small increased first cost, it becomes evident that that will be one of the easiest methods for ensuring a longer supply, for every year added to the life of a pole will mean the cutting of one pole less and one year more for a new tree to grow towards becoming a pole.

If we look for a moment at the advantages gained from increasing the length of life of a pole we will find that it is not only a gain because of longer service, but also a gain because thereby the cost engendered by the removal of the old pole and placing the new one will be avoided. A consideration of preservation

will mean likewise that the use of the very best material for poles (and cross-arms), may not be such an absolute necessity after all. There are many timbers whose strength requirements, straight trunk, etc., come fully up to the pole specifications, but whose length of life is comparatively short. It may be possible that these will become available when a method for economical preservation is found.

Summing the foregoing it may be said that preservation will mean increased length of life for poles, and a saving because of

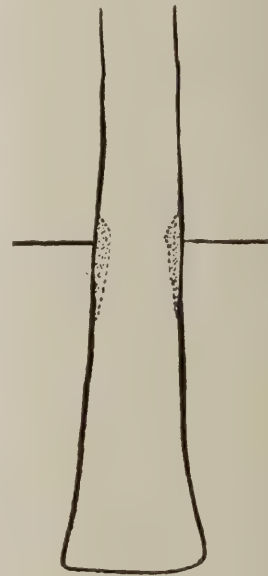


FIG. 1.—POLE SHOWING HOW ROT STARTS AT GROUND LINE.

absence of maintenance costs. It will mean the possibility of using sources of supply for poles not hitherto touched.

In the course of a brief paper it is impossible to more than touch upon the many phases of this question and to indicate the line of future investigation. To arrive at an understanding of what may be possible, it is necessary to discuss what longer or

shorter life in poles means and what the possibilities are for increasing life. When poles last only a short time it generally means that they decay, and will no longer support the weight of the cross-arms and wires. Decay as we now understand it, is caused by the growth in the wood, of lowly organized plants called fungi. These fungi extract certain parts of the wood fibre and thereby bring about disintegration of the fibre and consequent loss of strength. Fungi require certain conditions for development, and a proper understanding and appreciation of these

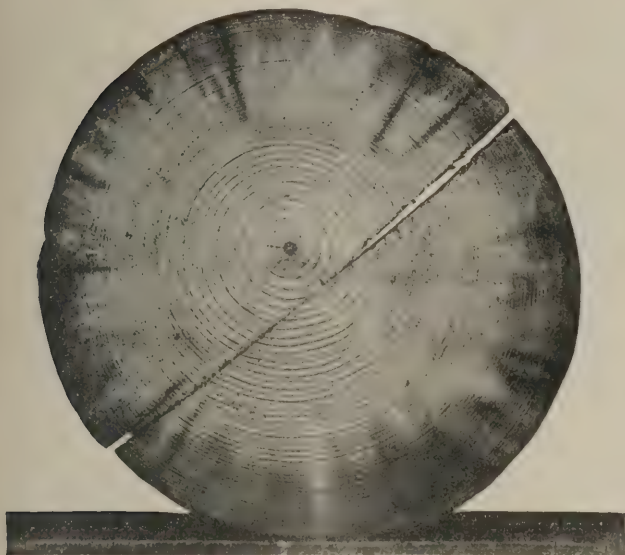


FIG. 2.—SECTION OF POLE, IMPERIAL GERMAN POSTAL SERVICE, TREATED WITH TAR OIL.—Reprinted from Bull. 14, Bureau of Plant Industry, U. S. Dept. of Agriculture, 1902.

Experiments have been made to find out whether by simple means it would be possible to prevent the decay of poles, but none of these tests have so far been very conclusive. The Bureau of Plant Industry in co-operation with the Bureau of Forestry of the United States Department of Agriculture has begun a series of tests which it is expected will be continued and enlarged, so as to include the whole country, to determine what methods if any can be used for increasing the life of poles. The first problem attacked relates to the time of cutting poles and to their proper seasoning. It is a matter of common knowledge that timber cut at one time of the year lasts longer than that cut at another. In the same way we know that seasoned timber lasts longer than unseasoned timber. It is proposed to ascertain in a definite manner what the relative values of seasonal cutting and seasoning may be, and to what extent it will pay to devote attention to these matters in making specifications for buying and setting poles. The results so far obtained with chestnut poles are very gratifying and a complete account of these results will soon be published.

Chemical treatment has been advocated many times, and is now used extensively in connection with cross-arms and conduits. The feasibility of chemical treatment depends largely upon its cost. In Europe, poles have been treated in one way or another for many years with excellent results. The pole section shown in Fig. 2, treated with tar-oil was recently cut from a German line and had been in service since 1873.

In Switzerland poles are being treated with copper-sulphate with good results. The objection to treating entire poles are two. In the first place it does not pay to treat ten times the amount of wood to keep one tenth, the butt, from decaying. In the second place the mechanical difficulties in treating poles are great, and it is consequently very expensive. Where the poles are cut locally it is very difficult to bring them to a treating plant and then remove them, especially if the line is not along a railroad. The writer is inclined to doubt the practicability of treating entire poles in the near future except under such conditions as where the transportation difficulty can be overcome. The fact that it may not pay to treat the whole pole by no means ought to discourage attempts to treat the base of poles. It has been indicated that decay can be largely prevented if we keep water away from the wood. If we therefore can treat the butt of the pole so as to keep out water and fungus spores, a great forward step will have been taken. With a properly seasoned pole it may be possible to force chemicals into the wood in sufficient quantity to secure all practical purposes of protection. Ways and means will no doubt be found, and a number of methods are now being tested. The subject will require a series of careful observations on a practical scale under as many conditions as possible. Due account should likewise be taken of the results so far obtained from several test lines now in operation.

If in conclusion, we survey the field of pole supply and pole preservation we may say that with the increased difficulty experienced in getting proper poles, and with the greater cost of poles, it is becoming a matter of some importance for those practically engaged in the development of the telephone industry, as well as those who construct and maintain lines, to view these problems with serious consideration. The possibility of a more rational utilization of our forest's resources than has been practised in the past, is receiving more and more attention to-day, and no one industry is more vitally interested in fostering such sentiment and encouraging it than the telephone and telegraph companies. Few are more interested than they in assuring themselves that the materials upon which their industry is so largely dependent is being put to the best use, and that the timber which they will want and may get, is being cared for in such manner as to yield them the largest amount in the shortest possible time, and, moreover, in such quantity as can be absolutely depended upon.

EDITOR'S NOTE.—A full discussion of the decay of timber will be found in the bulletin by the writer (which can be had on application), entitled "The Decay of Timber and Methods for Preventing It," Bull. 14. Bureau of Plant Industry, U. S. Dept. Agric., 1902.

Dr. von Schrenk is in charge of investigations in timber diseases, Bureau of Plant Industry, U. S. Dept. Agriculture.

conditions will do much to bring about a rational use of timber, and an ultimate saving. The conditions referred to are briefly:

1. Food supply.
2. Water.
3. Air (oxygen).
4. A certain amount of heat.

The fungus must have food. It finds this in the shape of the wood fibre and such organic compounds as occur in the wood. Sapwood contains more of these than heartwood, and on that account it rots so much faster than heartwood.

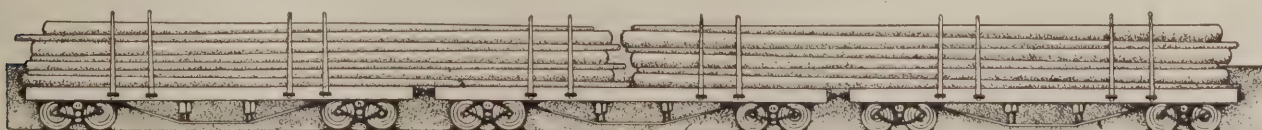
Water is the most important factor in promoting growth of the wood destroying fungi, and on that account promotes decay. Without water there can be no decay.

Air is an important factor, and some heat also. If we look for a moment at a pole set in the ground we find that it first decays at the surface of the ground or just below the surface as indicated in Fig. 1. The reason for this is that above the ground the wood has a chance to dry out, and there the fungus cannot flourish. Down in the ground where there is water there is not enough air, but just at the surface, or near there, we find both air and water, and there the decay sets in, and gradually spreads downward and toward the center.

If we would increase the length of life of poles, the first thing is to bring about conditions as unfavorable as possible to the growth of the wood destroying fungi. These methods naturally fall into two groups:

1. Prevention by natural preparation of the timber.
2. By chemical treatment.

Natural preparation, used in default of a better term, will include getting rid of as much water as possible, and keeping it away from the pole. Chemical treatment will mean the injection of salts into the wood so as to prevent the growth of fungi.



BETWEEN HEAVEN AND EARTH

The Telephone System of the New East River Suspension Bridge

BY GRAY W. JOHNSTON.



Of all telephone systems in the world, the system of the new East River Bridge is the unique one. It was installed to furnish a means of communication between the various points of the unfinished structure by the John A. Roebling's Sons Company, which is building the new bridge. This is the first case on record where the telephone was used in bridge construction. This bridge is the largest of its kind in the world. It was found practically impossible to properly do the work without the aid of some quick means of communication. The telephone was the best means that offered.

The system has five stations—one on the Brooklyn anchorage, one on the Brooklyn tower, one in the middle of the center span, one on the Manhattan tower, and one on the Manhattan anchorage. These are on the bridge proper. There is also one in the construction superintendent's office in Brooklyn. The system has been found invaluable and is kept constantly busy.

The men working on the bridge ever meet new problems, for the construction of a gigantic suspension bridge is a little known art. It is necessary that the trained engineers in charge of the construction be kept constantly in touch with the progress of the work. They have to meet and solve all difficult problems, and if they cannot be at once reached, it means that the entire work is held up until they find a solution. To dispatch a messenger to the Brooklyn office of the company means a long wait for his return. Besides this, it is a perilous trip to take. The only way at present is across a rickety foot bridge. This bridge is suspended on temporary cables that were strung across the river as soon as the towers were erected. It follows the curves of the immense steel cables that will support the bridge proper. The distance between the Manhattan anchorage and the Brooklyn anchorage is 7,200 feet, and the distance between the towers is nearly 1,600 feet. To make a trip from the Manhattan tower to the Brooklyn office would take a man about a half hour and as long to return with a message. The towers are 333 feet above high water, and this means that a human messenger to get to the top of the tower has to climb a little temporary bridge at an angle of nearly 45 degrees. The trip not only takes a lot of time but is very fatiguing, so this method was found impossible. Some better means was necessary and the telephone exactly met the requirements.

Whenever the men at work on the bridge wish to communicate with the engineers, all that is necessary is to go to the telephone and they are instantly in communication. In all likelihood the engineer after having the difficulty explained can give a solution over the wires and thus save not only the messenger, but himself a trip.

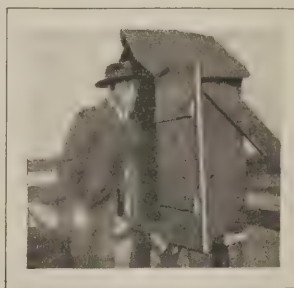
To accomplish this result, was the principle reason for the installation of the telephone system on the new bridge. After it was installed, it was soon learned there were hundreds of other uses to which it could be put. Many a weary trip along the dangling foot path has been saved. It is used to order supplies or material necessary in the construction work. The foreman of construction on one of the towers may run short of rivets or bolts, or any other supplies necessary in the construction. All that is necessary for him is to call up the superintendent's office and make known his wants. While the steel supporting cables

were being strung the telephone was put to constant use. It was necessary that the men stationed at various points on the bridge, keep in close touch with each other and the telephone was relied on exclusively.

The telephone is used also to signal the engineers. There are hoisting engines stationed at two points on the bridge, one on the Manhattan anchorage and one on the Brooklyn anchorage. The engineers have an electric bell signal which is used to indicate when to start or stop the engine, but there are times when more detailed instructions are necessary. The telephone is then called into use and the engineer with the receiver to his ear and one hand on the throttle, instantly knows what is required of him. At every stage of the construction work some new use for the telephone is found. Its utility and importance are hard to estimate. It really solves one of the most difficult problems of suspension bridge construction.

The telephones are crude affairs. They are all bridged on one line which runs the entire 7,200 feet of the bridge's length. In this respect they somewhat resemble some of the farmer's party lines. The line wire is No. 14 hard drawn copper twisted cable Okonite insulated. At the anchorages, where the line leaves the engine houses on either side of the river, the wire is simply laid on the stone surface. From there it leads to the

temporary foot bridge and is fastened to this by a plentiful use of copper staples. On the towers, the telephone sets are placed in rude booths. These booths also serve as coat lockers for the men. The photograph shows the box in which the telephone in the center span is placed. The telephone itself cannot be seen. This box is on a little bridge connecting the cables. The bridge is not more than 2½ feet wide, and



it was impossible for the photographer to so place his camera as to show the instruments. Although this is not the highest point on the bridge, it is undoubtedly the most novel situation for a telephone. When one uses this telephone he is standing only on a little plank about 1½ inches thick and below him there is about two hundred feet of air and the deep waters of the East River.

Neither the instruments nor the construction are what would be tolerated by patrons of a telephone system. Here there are no troublesome subscribers. The men who use these telephones admit that they are not perfect and that the talking is not as clear as it might be. But then everything connected with suspension bridge construction is difficult.

The only fault the men find with the telephone system is that there are not enough stations. Instead of six they say there should have been three times that number. At different points on the main span there should have been instruments, and at the foot of the towers and at the approaches there should have been many more.

TELEPHONE EXCHANGE ENGINEERING—ARTICLE II

Specifications for a Central Office Telephone Exchange Equipment

BY RAY H. MANSON, ALBION D. T. LIBBY AND CHARLES H. SIMPSON

THE engineer of a telephone company, having decided on the location of the exchange and kind of system, he is ready to ask the manufacturers of telephone apparatus for bids. If only the ultimate capacity and present equipment are specified, the bids may vary to a large degree or be unbalanced. To obviate this difficulty, a definite specification should be prepared and submitted alike to all manufacturers, and the following specification is suggested as a model:

SYSTEM.—The system called for shall be the common battery multiple type, lamp signals, double supervision. All current, except that used for ringing, shall be furnished by one battery plant located at the central office. The line and talking circuits shall be metallic, and balanced to be noiseless, and no circuits shall show cross-talk or other inductive disturbances.

SWITCHBOARD.

CAPACITY.—3,000 subscribers' lines, 60 incoming trunk lines, 120 outgoing trunk lines, 40 night service toll lines, 100 answering jacks (per position), 15 cord circuits (per position), 12 switchboard sections.

EQUIPMENT.—1,800 subscribers' lines, 40 incoming trunk lines, 60 outgoing trunk lines, 20 night service toll lines, 100 answering jacks (per position), 15 cord circuits (per position), 8 switchboard sections.

The present equipment of the switchboard is to be eight sections each of six panel, three position type. The first operator's position is to be arranged for night service; the second, third and fourth positions for incoming trunk lines, and the remaining twenty positions for subscribers' lines. The fourth and the last two positions are to be left blank. The switchboard is to grow from left to right.

FRAMEWORK AND ASSEMBLY.—The framework of the switchboard shall be of substantial angle iron, with all metal parts securely riveted or bolted together. All of the steel and iron, except planed surfaces, shall be thoroughly painted with a dark metallic paint of good quality, to prevent rusting.

All woodwork on the face and ends of the switchboard shall be of mahogany of a standard quality, finely finished and joined in a workmanlike manner. A suitable moulding shall be placed at the top of the switchboard and the general construction so designed, that when the sections are connected together, they shall have the appearance of one continuous framework.

The first section shall be provided with a left hand end cable turning box panel; switchboard moulding to extend around this panel. The eighth section shall be provided with a right hand end flat panel; switchboard moulding to extend around this panel.

Three removable paneled doors of mahogany for concealing the cords, shall be furnished for the front of each section. Five paneled doors of pine, stained to match mahogany and arranged to lift out, shall also be provided and so placed in each section, as to protect the connecting rack from impact of the cord weights. The rear of each section shall be closed by two removable doors, also arranged to lift out. These doors are to be of pine, stained to match mahogany and constructed with a sufficient number of panels and rails to prevent warping.

Each section shall be provided with a flat shelf of wood for plugs, supervisory signals, ringing and listening keys and push buttons. The rear portion of this shelf shall be in one piece, covered with seasoned sole leather, one-eighth of an inch thick and drilled for the plugs and supervisory signals. The front portion shall be hinged in three parts, one to each operator's position. Each of these hinged portions shall be built up of five layers of mahogany glued together; the grain of the two outside and center layers running lengthwise, and that of the other two layers running crosswise. An iron frame shall be fitted into each of

the hinged shelves, to which the ringing and listening keys may be attached by machine screws. A neat lock of standard design shall be provided for the key shelf at each operator's position. The bottom of the key shelf shall be covered with an apron of sheet iron properly enameled.

The face of the switchboard between the plug shelf and lower jack space shall be covered with seasoned sole leather one-eighth of an inch thick. Where sole leather is specified, it is to be of such dimensions as to effectually protect the parts of the switchboard on which it is located from impact of the plugs, and shall be cemented in place with the skin side exposed.

An answering jack cable running box of suitable hard wood with removable covers shall be provided, and located at the back of the framework, on the floor. Iron brackets shall be provided for supporting the multiple cable.

Brass foot rails provided with substantial supports shall be furnished for each section of the switchboard.

APPARATUS IN THE FACE OF THE BOARD.—The general arrangement of the board shall be as follows: At the subscriber's or "A" sections immediately above the lower rail are to be placed the answering jacks and the line lamp calling signals. The strips of answering jacks and lamp signals shall be mounted alternately and wired so that each answering jack appears immediately below its line signal. Above the space to be occupied by the answering jacks and line signals is to be a space for accommodating the outgoing trunk multiple jacks. Above this space are to be mounted the subscribers' multiple line jacks.

At the incoming trunk or "B" positions, where the answering jacks and line signals are not required, this space is to be filled with ebonized wood; each position to be provided with a "busy back" and "don't answer" jack.

At the night toll operator's position, toll line drops and jacks, and clearing-out drops are to be located in the space corresponding to that occupied by the answering jacks and lamp signals.

Pilot lamps are to be located in the lower rail just above the key shelf.

The shelf at each subscriber operator's position shall contain the local cord equipments and all special keys. Each local cord equipment shall consist of a pair of cords and plugs with a combination listening and ringing key, and with two supervisory lamp signals. The listening and ringing keys are to be so connected that the operator listens on the cord circuit by throwing the key lever from her, the key remaining locked in this position until restored. Throwing the key lever in the opposite direction rings on the front cord and the key returns to normal position when released. Directly behind the keys and on the same level the supervisory lamps are to be located and back of them the pairs of cords with which they are associated. At every alternate subscriber operator's position two two-way toll trunks are to be located, terminating in plugs with associated supervisory lamp signals. These plugs and signals are to be placed to the right, and in line with the plugs and supervisory signals of the regular local cord equipments. A strip of order wire keys shall be placed at the left, and in line with the listening and ringing keys.

The shelf at each of the incoming trunk operator's positions shall be arranged similarly to the local operator's positions. Each incoming trunk is to consist of a cord and plug, a supervisory lamp signal and a machine ringing key. This ringing key is to be so arranged as to throw ringing current out on the line when it has been set, and is to restore automatically when the called subscriber answers. Or some other method may be used provided it is satisfactory to the engineers of the telephone company.

The shelf at the night toll operator's position shall be arranged similarly to the local operator's positions. Each cord equipment shall contain a pair of cords and plugs, a clearing out drop, a supervisory signal, (the latter only on one-half of such cord circuits as are intended to operate in conjunction with local subscriber's lines) combination listening and ringing keys, and a ring back key. The combination listening and ringing keys are to operate the same as the keys in the local cord cir-

cuits, and the ring back keys, which shall be placed just back of the former, are to be so connected as to ring on the back cord of an associated pair, when the handle is pulled towards the operator; the key returning to the normal position when pressure is released.

ANSWERING JACKS.—The answering jacks shall be of the bridging type with no movable contacts. They are to be mounted ten per strip in a hard rubber mounting with polished face, and are to be of the most approved design and best material obtainable. The springs shall be made of German silver, and the insulation shall be of the best grade of hard rubber. Each answering jack shall be supplied with a removable number plate.

The night toll jacks shall conform to the specifications for toll line jacks as given under the heading of toll board.

MULTIPLE JACKS.—The subscriber's multiple jacks, and the trunk multiple jacks shall be similar in construction to the answering jacks, but are to be mounted twenty per strip. White holly strips are to be used for separating the several banks of jacks.

LINE SIGNALS.—The line signals shall be of the miniature incandescent lamp type, of about one-third candle power, requiring a current of not more than one-tenth of an ampere. These lamps to be mounted ten per strip in hard rubber mountings, provided with springs so arranged as to engage the terminals of the lamp, and hold it in its correct position. Suitable opalescent glass covers shall be mounted in removable brass caps in front of each lamp. Lamp caps and lamps shall be so arranged as to be quickly removed or replaced.

The toll line drops located at the night toll operator's position shall be of the same design as the toll line drops specified under the heading of toll boards.

SUPERVISORY SIGNALS.—There shall be two supervisory signals at each pair of cords, at each subscriber operator's position, mounted in the cord shelf to correspond with their respective cords, wired and connected to indicate when the called for subscriber has taken his receiver from the hook; when one subscriber has hung up and the other is waiting, and when both subscribers have hung up and the lines are to be disconnected.

Each trunk line cord at the incoming trunk position and the local half of each toll to local cord circuit shall be provided with a supervisory or disconnect signal.

All of the above supervisory signals shall be of the miniature incandescent lamp type, of about one-third candle power, requiring a current of not more than one-tenth of an ampere. Each lamp shall be mounted in an individual base or jack so as to be easily and quickly removed or replaced. Suitable opalescent glass jewels shall be mounted in removable brass cases above each lamp. Substantial open-work metal covers shall be mounted so as to protect the jewels from breakage due to impact of the plugs.

AUXILIARY SIGNALS.—There shall be a miniature incandescent lamp, so designed as to give a larger signal than the line lamp, placed at each subscriber operator's position, located in the lower left hand panel of the position, to be used as a "calling pilot" signal. This lamp shall be connected so that it will light whenever any calling signal in its position is operated, and so that it will be "thrown out" when the answering plug is inserted. A white opalescent glass jewel shall be mounted in a removable brass cap in front of the lamp.

A miniature incandescent lamp of the same description as the "calling pilot" shall also be placed at each operator's position, located in the lower right hand panel of the position, to be used as a "supervisory pilot" signal. This lamp shall be connected so that it will light whenever a supervisory lamp on the answering side of any local cord circuit, or single lamp in the other cord circuits is lighted. A red opalescent jewel shall be mounted in front of this lamp.

Both pilot lamps shall be so connected that a night bell or buzzer shall be operated when either lamp lights, that operation depending on the position of a switch.

LISTENING AND RINGING KEYS.—All keys shall be of the latest improved pattern; the springs being made from the best German silver, mounted in rigid metal frames and insulated with the best grade of hard rubber, all contacts being of platinum.

PLUGS.—The cord circuit plug shall be substantially constructed of suitable metal, the contact pieces being securely fitted and insulated with the best grade of hard rubber. The terminals for these contact pieces shall be located in the body of the plug, and provided with binding screws for making reliable connections to the cord terminals. An insulating sleeve of fibre shall be pro-

vided for covering the plug, serving the purpose of a handle and a protector for the cord connections. The plug sleeves shall be turned so as to make a perfect fit with the jack sockets and the contact pieces so spaced as to make reliable connection with their respective jack springs; the latter tending to lock the inserted plug in place.

The operators' head telephone plugs shall be similar in construction to the cord circuit plugs, but are to be provided with a short body and handle, so as not to project an objectionable distance from the front of the key shelf when inserted.

CORDS.—The connecting cords shall be made of suitable, flexible, low resistance conductors, carefully insulated from each other and protected by an armor of spiral spring wire, upon which are two braids, the outer one being of linen and well reinforced. The conductors at one end of the cord, shall be provided with terminals arranged to clamp under the binding screws of the plug, and shall be so designed that the parts will not become "crossed" if the binding screws become loose. The plug end of the cord shall be reinforced with an additional braiding, to reduce to a minimum the breaking of conductors through wear. The conductors at the fastening ends of the cords shall terminate in spade terminals arranged to be clamped to the cord fasteners with machine screws. This end of the cord shall be provided with a stay cord, preferably a continuation of the outer braiding, to remove all strain from the terminal connections. The cords shall be of sufficient length to reach, without strain, the furthest jack on each of the adjacent positions of the switchboard, after allowing ten inches for "re-butting."

The operators' head telephone cord shall be made up of two conductors of best grade of tinsel, each being carefully insulated and provided with outside braidings, the whole being enclosed by a braiding of green silk. These cords shall be reinforced at the plug end, and so fastened as to effectually prevent breakage of conductors through wear.

CORD WEIGHTS.—The cord weights shall be so designed as to properly restore the cords, without interference and tangling. The pulleys shall be made from boxwood or brass smoothly finished so as not to wear the cords.

RESISTANCE COILS.—If resistance coils are to be used in the circuits they shall be constructed of a size of wire sufficient to carry the required current without developing abnormal heat. These coils shall be mounted on metal bases, and located at some convenient place near the apparatus to which they are associated.

REPEATING COILS.—If repeating coils are to be used in the cord circuits they shall be made with four windings of silk covered copper wire, carefully insulated from each other and brought out to suitable terminals. These windings are to be over a core of annealed iron wire which, together with an enclosing shell of soft iron, is to form a closed magnetic circuit. The repeating coils shall not give any "cross-talk" when mounted in close proximity on racks provided for them.

RETARDATION COILS.—If retardation coils are to be used in the circuits, they shall be wound with silk covered copper wire, over a core of annealed iron. When these coils are mounted in close proximity, they are to be provided with individual annealed iron shells, entirely enclosing the spools, so as to effectually prevent "cross-talk."

RELAYS.—All relays which are to work through the resistance of the line circuit shall be designed to operate on a line resistance of seven hundred and fifty ohms; when adjusted to fail to operate on ten thousand ohms. This latter resistance represents the maximum line leakage to be allowed; therefore, the test for releasing shall be made after operating the relay on a short circuit. Relays to be operated through the resistance of a local circuit shall be designed with firm reliable contacts, and are to work properly with a suitable margin through such resistance.

The relays connected with the cord circuits shall be mounted on iron strips, and located in the back of the position on which the cords appear. These relays shall be of the individual style having all the working parts enclosed in a seamless, dust proof shell. The shells are to be so arranged as to be readily unscrewed and removed, without in any way disturbing the connections leading to or from the relays, or exposing the working parts or contacts of any other relays, than the one examined. All cord relays shall be plainly marked, showing with what particular circuit they are connected. The relays connected with the line circuits shall be mounted on iron strips, provided with dust proof covers, and located on a relay rack.

All relays shall be of the closed magnetic circuit type, the cir-

cuit being made through carefully annealed soft iron. The coils shall be wound to suitable and nearly uniform resistance with the best grade of silk insulated copper wire, the ends being brought out to reliable terminals. All contact points shall be of platinum securely riveted in place.

TRANSMITTER HOLDERS.—Each equipped operator's position shall be provided with an overhead transmitter holder, so arranged that a transmitter suspended from it may be adjusted to any height or distance that may be desired from the switchboard. The transmitter holder must not connect the transmitter rigidly with the switchboard framework, so as to be subject to vibration.

OPERATORS' TRANSMITTERS.—A granular carbon, polished button electrode transmitter of the latest and best design shall be provided, and suspended from each of the transmitter holders. These transmitters shall be wired, and connected with all necessary auxiliary apparatus, so that current for their operation can be supplied from the main exchange battery, independent of the cord circuits.

The granular carbon and electrodes shall be enclosed in a moisture proof retaining cup provided with an auxiliary or insulating diaphragm of some substance, preferably mica, not subject to deterioration from heat. The transmitter diaphragm shall be made from some suitable metal not subject to corrosion. The retaining case of the transmitter shall be made from metal, so distributed as to prevent undue vibration during conversation of all parts, except the diaphragm of the instrument.

OPERATORS' RECEIVERS.—Each equipped operator's position shall be provided with a head telephone with silk cord, terminating in a receiver plug. Two spring jacks shall be provided for the plug, and so wired to the operator's talking circuits that when the plug is inserted in either of them, the head telephone is properly connected and the transmitter circuit is closed. One of these jacks shall be for regular use and the other for an extra receiver.

These receivers shall be small, light in weight, and so constructed that the possibility of the operator's hair becoming entangled will be reduced to a minimum. They shall have compound permanent magnets of the best quality of magnet steel; the coils to be wound to a suitable and nearly uniform resistance, and the whole encased in a hard rubber shell.

LIGHTING.—The front and back of the switchboard shall be wired for a sufficient number of sixteen candle power incandescent lamps, to thoroughly light the board for operating and making repairs. The wiring shall be of the best quality of rubber covered wire, and include the furnishing and installing of lamps, sockets, brackets, reflectors, fuse terminals, etc., ready for connecting to the regular electric light circuit. All of this wiring shall conform to the requirements of the National Board of Fire Underwriters.

NUMBERING.—The positions at the switchboard shall be numbered from one to twenty-four inclusive, with two-inch gilt figures placed immediately to the right of the transmitter holders, and shall grow from left to right.

The multiple jacks shall be numbered in groups from naught to ninety-nine. They shall be located in such a manner that the jacks of each group will lie in a straight line from the left to the right hand end of each section; naught to nineteen appearing in each panel on the first row of multiplied jacks, twenty to thirty-nine on the second row, etc. On the stile strip to the left of each group shall be placed a number plate, which is to designate the hundred the group represents.

The number of an answering jack which is associated with the multiple shall be indicated by a removable number plate placed adjacent to the answering jack. These plates shall be interchangeable, so that when a line is moved from one operator's position to another, its number plate may be changed to the new location.

All apparatus such as relays, coils, etc., mounted in the switchboard section shall be numbered, or otherwise marked to correspond with their respective circuits.

INCOMING TRUNK CALLING CIRCUITS.—One trunk calling circuit from other local exchanges shall be brought through the distributing board into each incoming trunk operator's position, and arranged so that it may be connected directly with the operator's telephone set at the main distributing frame.

OUTGOING TRUNK CALLING CIRCUITS.—Each subscriber operator's position shall be provided with ten buttons, each connected so that when pushed the operator will be bridged in on an out-

going trunk calling circuit. These outgoing trunk calling circuits shall be multiplied at each third subscriber operator's position, and shall run through the cross-connecting boards at the rear of the switchboard and main distributing frame in the terminal room.

BUSY TEST.—The circuits shall be provided with an audible busy test, whereby any operator may determine whether or not any line on the exchange is in use, by touching the tip of the connecting plug to the ring of the multiple jack of the called for subscriber. If the line is in use, she shall hear a "click" in her telephone. If no "click" is received, the line will be free and she inserts the plug into the jack.

BUSY BACK AND DON'T ANSWER SIGNALS.—There shall be a spring jack in each incoming trunk position, arranged and wired so that when a "B" operator finds a line busy, she can by putting her connecting plug into this jack signal "disconnect" to the local or "A" operator, who originated the call by operating the latter's supervisory lamp, and at the same time put an interrupted "tone" or "busy" signal on the line, to designate the reason for this disconnect signal. There shall also be a spring jack in each incoming trunk position arranged and wired so that when a "B" operator fails to raise a "called for" subscriber, she can by putting her connecting plug into this jack signal "disconnect" to the local or "A" operator, who originated the call, by operating the latter's supervisory lamp, and at the same time put an interrupted "tone" or "don't answer" signal on the line to designate the reason for this disconnect signal.

OPERATION OF CIRCUITS.—The method of making connections and the operation of the signals in conjunction with the system embodied in these specifications shall be as follows, or in some other way equally acceptable to engineers of the telephone company:

Local Connections.—In order to call central ("A" operator), the subscriber removes his receiver from the hook, by this action causing his lamp to light at the exchange office. The operator answers by inserting the answering (back) plug of any pair of cords in the jack corresponding to the line lamp, and throwing the lever over into the listening position. This operation shall extinguish the line lamp and connect the operator's talking circuit to the subscriber's line; the supervisory lamp for that cord remaining unlighted. After obtaining the number of the subscriber wanted, (which in this case will be considered as one terminating in the same exchange) the operator tests, and if the called for line is free she inserts the connecting (front) plug in the multiple jack of the line "called for," and rings the subscriber by pulling her key lever forward. The act of inserting the plug shall light the front supervisory lamp, which shall remain lighted until the called for party answers, when it shall be extinguished. In case either party hangs up his receiver, he shall cause the lamp corresponding to the cord with which he is connected to become lighted, and by working the hook up and down, also the corresponding supervisory lamp shall flash, and thus attract the operator's attention, (where another call is desired immediately). When both subscribers have hung up, both lamps shall be lighted, which will be a signal that conversation is finished, and that the corresponding cords can be taken down without listening in.

Trunk Connections.—The subscriber's, or "A" operator, receiving a call requiring connection with another exchange of the system, shall press a push-button, which will put her telephone apparatus in direct connection with that of the incoming trunk, or "B" operator, of the exchange with which connection is desired. The "A" operator states the number wanted. The "B" operator designates the trunk line to be used, which trunk line shall appear as a jack in front of the "A" operator, who plugs into this jack with the connecting plug of the pair of cords she is using. The "B" operator will ring the "called for" subscriber by depressing the calling button of a machine ringing key, which shall designate by releasing from its locked position, when that subscriber has taken his receiver from the hook. The "A" operator supervises the connection in a similar way to the supervision designated under *Local Connections*, and when her lamps show that both subscribers have "hung up" she shall, by pulling down her plugs, cause a lamp to light at the "B" operator's position, showing that the connection is no longer necessary, and that the latter may remove her plug. The signals at the "B" operator's position shall be so arranged and wired, that the "B" operator can see definitely whether the called for subscriber has yet answered, or whether the connection is no longer desired.

IN "SKY-SCRAPER" CONSTRUCTION

By STANLEY C. HOWELL.



IN the construction of modern steel-frame buildings, as in every other walk of life, the telephone has a place. Its use here is to connect the various floors, as they are in course of construction, with the superintendent's office on the ground.

In the photograph, an ironworker is shown. At the instant the picture was taken, he was receiving instructions from the construction superintendent fifteen stories below. The building is the "Whitehall," a new "sky scraper" being constructed overlooking New York Harbor. In the background, looking through the big steel girders that will uphold the remaining five stories of the structure, a line of other "sky scrapers" can be seen. The roofs of some of Old New York's buildings along the water front, are also shown.

It is apparent that some means of communication in a building of this kind is necessary during the process of construction. Formerly, there were only two safe ways. One of these was to send a boy up the fifteen or twenty flights of stairs with a message, or with a request that the person wanted come down. The other was to make a personal trip. Either of these methods were time-wasting and laborious. Several boys were always employed, their salary alone being sufficient to pay for the rental of a complete telephone system in the building. Besides this one item, the workman if summoned down, consumed a good deal of time and effort in the trip, that could have been more profitably employed. Or, if the superintendent or architect or other official, made the trip himself, it was

simply his time and effort uselessly wasted.

Another method, but one not much resorted to, was sending a written message up on one of the freight hoists, weighed down with a brick. In about nine cases out of ten, the message was never seen, and after waiting impatiently for an answer, the superintendent or whoever had sent the message, most likely resorted to the second method. The old adage that "if you want a thing well done, do it yourself," applied with true force to this situation, and that is what the "sky scraper" men most frequently did.

Necessity was the mother of invention, however, and the telephone was thought of. As soon as the initial one was installed, it jumped into instant favor. Its advantages were apparent and where installed it has always saved in time and effort twice its cost. At first, naturally enough, there was a slight prejudice on the part of the men against it. Or sometimes, the habit of making trips in person to consult the superintendent or engineers or architect, was so strongly developed, that they forgot the telephone. But once or twice climbing twenty flights of stairs when there is no necessity for it, tends to develop a man's remembering faculty. They soon came to use the telephone and to look on it as their best friend and ally.

The first "sky scraper" system installed, consisted of only two



ON A "SKY SCRAPER" FIFTEENTH FLOOR.

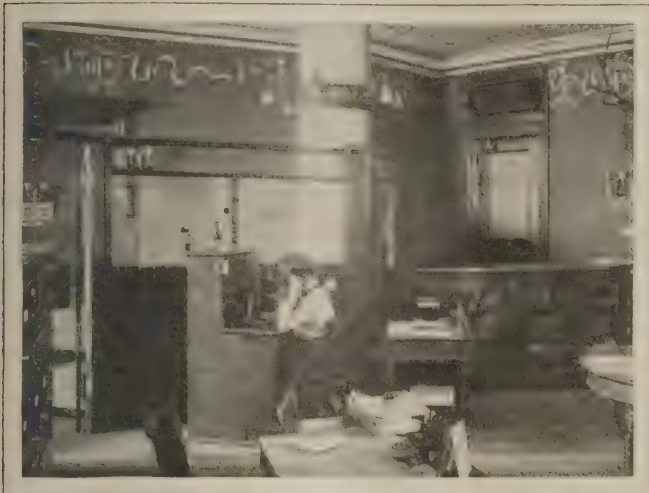
stations, one in the superintendent's office and one on the top-most floor as the building progressed. But in later systems, a telephone has been put on every floor as soon as the flooring was placed. The various stations are bridged on one line, and each floor has its code signal, composed of short and long rings.

THE PRIVATE BRANCH EXCHANGE

By H. D. GILBERT.

TO a telephone company and to its subscribers the private branch exchange is a most valuable feature. It means a largely increased revenue to the company for a practically small outlay. It is very much easier and cheaper to operate private branch exchanges than it is individual subscribers. For the telephone user it is a business getter. It is even a better thing for him than for the telephone company. Its saving of time and the additional business it brings more than pays for the additional expense. An instance that was brought to the notice of the writer recently corroborates all of the foregoing. An enterprising telephone manager in an Eastern manufacturing town saw that it would be of immense advantage to his company to install more private branch exchanges. He went around to several of the large houses in the town, but failed to persuade them wherein they would be benefited by the installation of a branch exchange. One of the firms that he tried to persuade to put in a branch exchange operated a large factory. They employed several hundred people, and had only two instruments in the entire establishment. The telephone manager selected one of his employes, a young man who had shown much business talent and efficiency, and got leave from the firm to place the young man in charge of the telephones in the factory. His business was to answer all telephone calls and then to summon whoever was wanted. The factory was in a large building covering an enormous floor space, and was four stories in height. Every time a call came in for anyone in the factory the clerk kept the exact

time consumed in getting the person wanted to the telephone and the time it took him to return to his work. In many instances the person wanted would be on the third or fourth floor. At the end of the week the telephone manager took the report to the heads of the firm and asked them to figure out the value of the time lost by employees being called to the instrument. The members of the firm were astounded at the result, and the telephone manager followed up his advantage and pointed out that



A PRIVATE BRANCH OPERATOR.

the result in dollars and cents would more than pay for the installation and rental of a private branch.

He had not the least difficulty in getting a contract on the spot for a private branch exchange equipped with twelve stations. The firm now has four or five trunks from the private branch to the company's exchange, and has added many telephones to the equipment. The manager at every place where he met difficulty in getting a contract for a private branch adopted the same method and was successful with hardly an exception. The result is that his company has increased its revenue almost double.

The private branch exchange brings business to the firm that installs it. To a person who uses the telephone it is very exasperating to be told that a line is "busy" and have to wait to get a connection. If a customer learns that the telephone of the person with whom he deals is always busy, he is likely to give his business to some firm whom he can quickly secure by telephone.

A person who has a private branch exchange never turns away business in this way. Incoming calls can always be attended to. He finds that his business increases in ratio to the number of telephones he has. The successful business firm installs a private branch exchange, and the successful telephone company seeks to extend this class of business.

TELEPHONING UNDER THE SEA

By GEORGE S. HAVENS.

SUBMARINE divers now use telephones. They fill a long-felt want in this perilous work. Divers have always been handicapped because they could not keep in touch with those above water and give the results of their work. They were left to their own resources, immediately the water closed over the heavy brass helmet.

Now all this is changed. The diver can talk to those above water as readily as though he was on terra firma. He descends to inspect the hull of a disabled vessel, for instance. He has a receiver and transmitter inside his helmet. The captain of the vessel or some other official has a set connected with the diver's. The diver telephones the exact conditions as he finds them, and the official at the other end makes notes as the investigation proceeds. He can then give the diver instructions or suggestions as to possible methods of repairing the damage.

Or perhaps it may be a sunken ship the diver is working on. Part of the cargo may be perishable, and some may be of great value and worth saving. A person acquainted with the contents of the vessel is connected with the diver's telephone outfit. He

directs the diver how to go about the work of salvage, and what packages he shall have drawn up. The diver, in turn, telephones the condition of the cargo, and any other results of his investigation.

Although the line signal is still used as an auxiliary to the telephone the diver uses the latter for indicating his desire for more or less air, or more rope, to come to the surface, etc.

The telephone equipment is very simple. It can be fitted to any diving armor. A transmitter is fastened on a stout canvass cap with a leather chain strap inside the helmet, in such a position that the diver can talk directly into it. Fastened to the same leather strap is the receiver in such a position that it remains pressed against his ear. The connecting wires lead from the helmet through the air pipe or signal rope. The assistant, or whoever is fitted with the connecting set, has an equipment which can be seen plainly in the photograph. It consists of an ordinary head receiver and a breast plate transmitter. This leaves his hands free to execute the commands of the diver, while at the same time, he is constantly in communication with the diver. The diver carries neither batteries nor bell. His assistant has a two-cell dry battery in the leather carrying case slung across his shoulder, and which is plainly indicated in the photograph.

In the profession of diving, it is difficult to estimate the vast saving in time and money effected by the use of the telephone. A diver can do about twice as much work with it in a day than he can equipped only with the signal line. As divers command very large salaries, this is an important saving. Besides the more expeditious examination and repairing of an injured vessel or salvage of the cargo of a wrecked ship, saves a very large sum. In many cases it may save the life of the diver. His signal line may get tangled and at the same time some unforeseen accident overtake him which may make it imperative for him to immediately come to the surface. If he is not equipped with telephones, he is then unable to indicate his desire to come up, and his death may result. Many such accidents have been reported, although



DIVER EQUIPPED WITH A TELEPHONE.

the writer has never heard of a diver's life being actually saved by his being equipped with telephones. This merely serves to show the possibilities.

The United States Navy first used telephones in connection with divers in this country. They were immediately successful and led to the installation of telephone outfits on every suit of armor furnished the navy. Commercial divers were quick to see the advantages of such equipments, and at once took it up.

CONDUIT MANHOLE ROOFS

By W. R. HARRIS

ONE of the most important parts of an underground conduit system is the manhole roof and cover, which, being subjected to the impact of passing vehicles and the vibrations caused thereby, should be amply strong to support any load imposed. A roof improperly constructed, even though it may stand for a time, may collapse if subjected to an unusual strain. Any damage resulting to persons or property would cause litigation, the cost of which would pay for many manholes of proper design and construction.

The space between the street surface and the tops of the ducts, permitting a small manhole, can have an arched roof of brick of any desired strength. Space, however, is what is desired in a manhole. To gain sufficient head-room and working space it is sometimes necessary to make a roof very flat and thin. Such roofs are also rendered necessary where the ducts are laid at shallow depths to avoid obstructions.

To make a flat roof some engineers have used I-beams, angle iron, railroad iron, etc., building brick arches of slight rise and short span between the I-beams or by laying brick on edge on the flanges thereof. The latter is a makeshift method and is poor construction; besides, it requires a greater quantity of structural steel, for brick arches built between the I-beams permit a spacing of three feet or more between the centers of the beams; while, if the bricks are laid on edge, the spacing cannot exceed ten inches.

The arch makes a better appearance with a smaller quantity of iron. Its only fault lies in the fact that the exposed flanges of the I-beams are subjected to the action of moisture, and oxidization can only be partially prevented by periodical scraping and painting. Other engineers have used concrete roofs strengthened with I-beams, or, to speak somewhat ironically, I-beam roofs with a filling of concrete. In these roofs, five feet square, two ten-inch I-beams are placed across the hole, about thirty-two inches from center to center and between the ten-inch beams, four five-inch I-beams are set. A form is then placed

in position, and the concreting laid to a thickness of twelve inches, which allows one inch of concrete below the beams and one inch above.

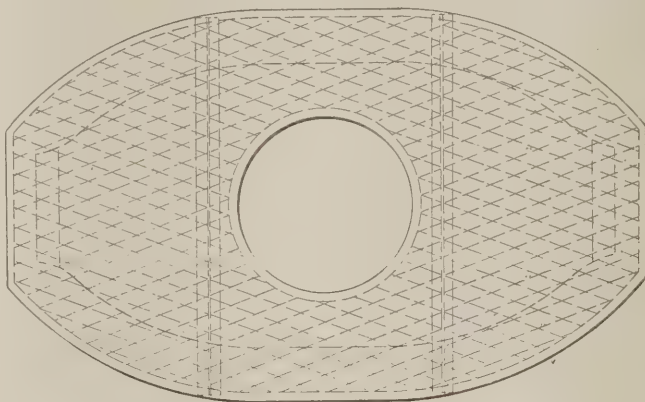
For a manhole seven feet square, two 12-inch and four 7-inch I-beams are used. If the manholes exceeded seven feet by seven feet, more beams and larger are used, and the foregoing list shows the sizes of some manholes recently built with the quantities of iron and concrete used in the roofs.

By using expanded metal concrete roofs a great saving in both I-beams and concrete can be effected without sacrificing strength. Concrete has been used for over 2,000 years as a building material, and since the experiments of F. Coignet in 1869 and Jean Monier in 1876, iron and steel, in various forms, have been used to reinforce concrete with great success.

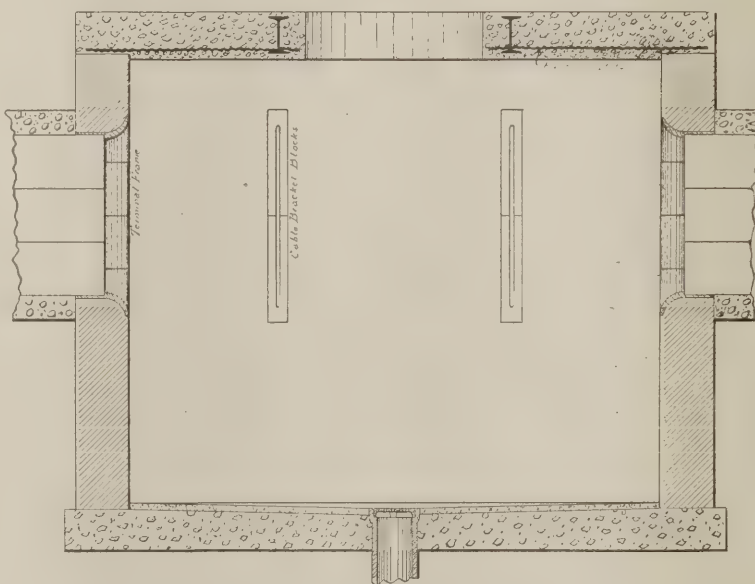
A valuable method of combining iron and concrete has been developed and perfected by a number of metal manufacturing companies, and has been used for construction work of all kinds. Manhole roofs constructed according to this system form a cover of great strength and durability. Roofs can be constructed as shown in the drawing. The I beams are used as supports for the manhole casting and also to give additional strength to the concrete. When the walls are brought to the proper height the I beams should be set in place and a temporary form of smooth matched boards placed in position so as to leave a space of one inch between the bottom of I beams and the form. The form should be built so that the beams will be

entirely encased in concrete, as indicated in the drawing, thus leaving no surface of the steel exposed to the air.

After the form is in position, spread a coat of Portland cement mortar (using equal proportions of cement and sand) over it to a thickness of about one inch, and then add a layer of fine concrete not exceeding one inch in thickness. The sheets of expanded metal should now be laid in place and more concrete placed above, to a thickness of about four inches. Tamp well and add the rest of the concrete necessary to cover the I beams and tamp it well. Allow the form to remain at least seven days, and do not pave over the manhole for three or four days. This form of roof eight inches thick is much stronger than a concrete roof sixteen inches thick not reinforced with expanded metal. The expanded metal should be three inch mesh number ten gauge. Use for concrete good clean stone free from dust; the stone should pass through a



PLAN



SECTIONAL ELEVATION

Size of Manhole.	Size of I-Beams.	Weight of I-Beams.	Cu. Yds. Concrete.
5. feet x 5. feet	5-inch and 10-inch	537 lbs.	1.15
7. feet x 7. feet	7-inch and 12-inch	760 lbs.	2.44
7.5 feet x 9.5 feet	12-inch and 15-inch	2,724 lbs.	4.00
8. feet x 10.7 feet	12-inch and 15-inch	2,939 lbs.	5.00
9.2 feet x 21.3 feet	10-inch and 12-inch	4,681 lbs.	11.00
10.5 feet x 11.8 feet	12-inch and 15-inch	4,350 lbs.	6.80

CHANGES IN SUB-STATION WIRING

BY CHARLES E. MONROE

MANY small exchanges started with the simplest possible system, consisting of two instruments in series on a single line with a ground return, the extensions being made by cutting in a loop as at A or by extending the line, as at B (Fig. 1).

As the addition of each instrument decreases the loudness of

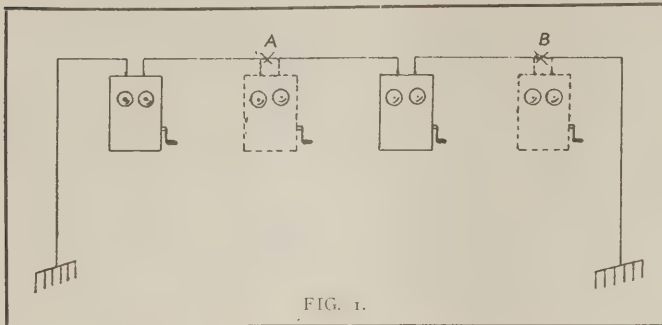


FIG. 1.

both talking and ringing, this method is not advisable where there is any prospect of an increase to more than three or four stations, and the rapid increase of electric light and power wires has caused the abandonment of grounded circuits.

Instruments of this type can be changed over to bridging by the removal of the shunt on the generator; the insertion of a button for ringing; and the increasing of the ringer coils to the desired resistance.

Fig. 2 shows the method of changing, the waving lines representing the wires to be removed, and the dotted lines, those to be added. The generator being of a smaller size and of a different

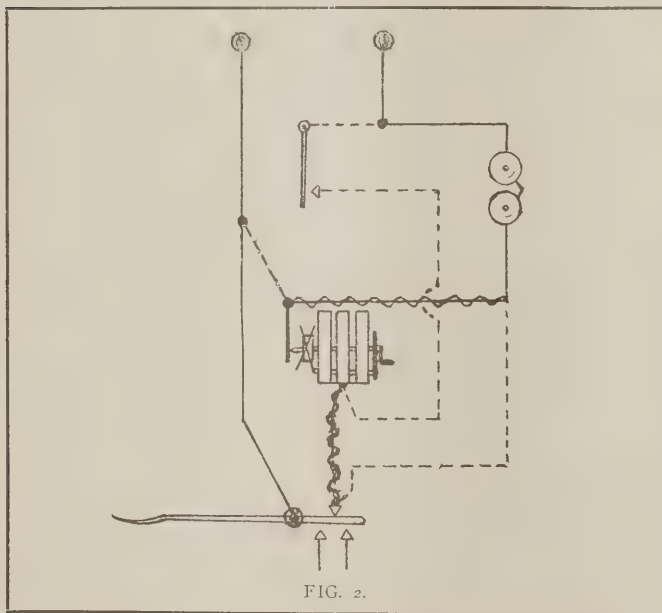


FIG. 2.

construction than what is generally used on a bridging system, the instrument when rewired cannot be used on very heavily loaded lines.

The bridging system, used for party lines is usually constructed with a metallic circuit, although in country districts, where free from light and power wires, the grounded circuit is frequently used.

A more powerful generator is used for this type. This is effected by increasing the number and size of the permanent magnets and by placing of less turns of a coarser wire on the armature than is customary in the series type. The ringer coils are wound to a high resistance, varying from 1,000 to 2,500, 1,600 being the most desirable resistance for the regular sized coil. Unless the cores are elongated, any extra turns of the same size wire are too far from the centre to be of much service, and if smaller wire is used, the effect is lost by decrease in the number of

turns. Most instruments of this description are equipped with a cut-in attachment, which throws the generator circuit on to the line when the crank is turned. On heavily loaded lines a push button is sometimes preferred, in order to make the signals more distinct. The button can easily be added (see Fig. 3) and at the same time the loose motion on the crank shaft should be taken up by the means of washers, although it is not actually necessary.

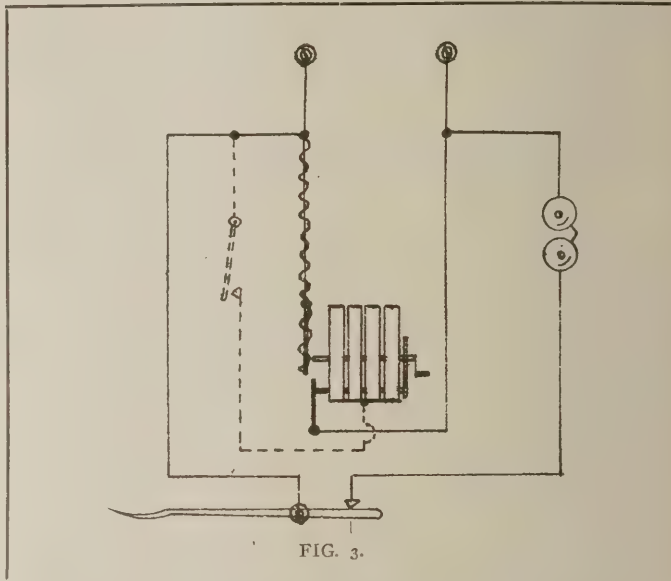


FIG. 3.

In the series type it was generally considered advisable to allow the bells to ring when a call was being sent, thus showing that the current was passing through them out on to the line.

In the bridging instrument the ringing of the bell indicates only that the current from the generator is passing through the bell, hence not being serviceable as a line test, it is sometimes undesirable. By using a strap key or three point button this can be accomplished as shown in Fig. 4.

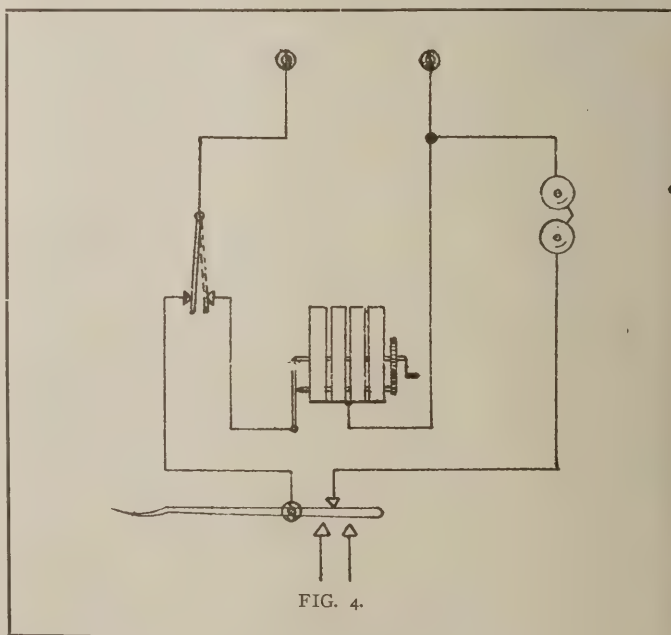


FIG. 4.

Simple changes of this description will often keep instruments in service until the growth of the system warrants a new equipment.

CONTEMPORARY CROSS-TALK

By "The Listening-Key."

IN discussing the question of the time occupied by the average connection we set out to find a compensating influence to offset the growth in the distance over which the average message will have to be carried. This increasing range of the average message has been fully demonstrated and must be reckoned with in serious telephone work, without any question of a doubt. That being so, as we are engaged in analyzing telephone traffic on the basis of the minute-mile unit—which has been clearly demonstrated to be the true unit by which to measure telephone service—it is clear that the only compensation for the increase of distance traversed by the average message is a decrease in the time occupied by the average message. If we can reduce the time we can hold the balance even, as it were; we can regard with equanimity the increase in the miles, provided that we can effect sufficient reduction in the one factor to offset the increase in the other and so maintain the product at about the same figure. For example, assume that the average local telephone message is now carried half a mile and occupies three minutes. That will give for the average message $1\frac{1}{2}$ minute-miles. If, when the distance which the average message has to be carried becomes three-quarters of a mile, the time occupied by the message has been reduced to two minutes we shall still be supplying only $1\frac{1}{2}$ minute-miles, the same as before.

* * *

The time occupied by the message consists of two periods, the period occupied by the conversation proper, and the period occupied by the operating of the connection. This latter may be subdivided, as we have seen by our analysis of the operation of a connection, practically into three parts, viz., the operations for which the operator is exclusively responsible, the operations for which the operator and the subscriber are each partially responsible and the operations for which the subscriber exclusively is responsible. It is clear that by properly selecting, training and supervising our operators, and by systematically educating our subscribers we can reduce the time of operating the average message; that we can reduce the time occupied by the message itself—the actual conversation—is not so clear, but, as we shall presently show, we can exercise a certain amount of influence to that end also, and, moreover, there are natural causes at work to effect a shortening of the time occupied by the actual conversation. So that not only can we help to keep the number of minute-miles in the average local telephone message within reasonable limits, but fortunately the very traffic itself contains a compensating factor on the right side.

* * *

Lest this last statement should appear obscure, let us examine the reasons for it at once, because nothing is less desirable in a technical discussion than obscurity, and unsupported statements of a vague nature jotted down for future explanation are apt to cause impatience on the part of the enquiring reader. There are several reasons why the average local telephone message should tend to occupy less time than it formerly did or that it actually does at present. One is that with the general growth of the telephone habit the average telephone user becomes more expert in the use of the service. The improved quality of the service, as regards clearness of talking, is also of assistance in this direction. The general standard of telephonic transmission is much higher than it was a few years ago and it is very rare now in local communications for two subscribers to be on a line over which both cannot hear perfectly. The result of this easy, clear talking and of the widespread familiarity with the use of the telephone is that far less time is wasted over preliminary and unprofitable conversation than was formerly the case; such enquiries as "can you hear me now" and "is that better?" "who are you?" "I can't hear you" and so on, interspersed by a running fire of "hellos," are now comparatively rare accompaniments of a local telephone message, whereas a few years ago they were almost invariably a part of the work of telephoning.

* * *

The higher standard of service that now prevails and the general acquisition of the telephone habit have resulted in a smarter and more business-like method of telephoning being generally adopted. As a general rule the called subscriber simply answers "hello" or "yes" on taking down the receiver in answer

to a call, and the caller says "Is that Blank—this is Dash" and goes straight ahead with his message. Very often, thanks to the improved transmission that is now so general, the caller at once recognizes the voice of the person who answers the call and says, "Hello, Fred, this is Jim. Can you come up to dinner to-night?" or something equally direct, if not always so agreeable and hospitable. Therefore there is a double gain from the improved quality of the transmission, for not only are all the time-wasting preliminaries, questions and repetitions done away with, but the very fact that the talking is so clear and distinct and the communication so easily tends to make people as natural and direct in their manner of talking as they would be in talking face to face. This necessarily means a large gain in the time occupied by the average message, and as the quality of the service is being steadily raised and the general public is getting more and more accustomed to using the telephone service it is a gain that will continue to be felt.

* * *

The fact that the general public is getting more expert in handling the telephone service is quite evident to any telephone man. That it is not yet nearly so expert as it might be is a point that has already been discussed; and, since an improvement can hardly be made in the public method of handling the operating part of the message without in a certain degree extending to the conduct of the communication itself, the telephone manager who sets out thoroughly to educate his subscribers will be in a way to effect far-reaching economies in his operating expenses. It is hardly reasonable to suppose that a telephone subscriber, thoroughly impressed by an explanation of the advantages of smart operation of the subscriber's end of the service, will take pains to operate quickly and correctly and to answer promptly and then become diffuse and time-wasting when he is in actual communication with his correspondent. Therefore the good and profitable influence of systematic education of telephone subscribers will extend beyond the operating proper and will have its effect in saving time on the average message in the period occupied by the actual message itself as well as in the period occupied by the operating.

* * *

Even without the systematic education that one would like to see practiced, the average telephone subscriber is of his own accord becoming more direct and concise in his telephonic communications, partly because the telephone is no longer the novelty it once was and partly because he wishes to save himself unnecessary work. In the early days of the telephone many people had the greatest difficulty in saying "good-bye" and would go on discoursing amiable twaddle of no interest to either end of the line, simply because of a nervous disability to break off and say good-bye. There are such people to-day, just as there are those that have difficulty in getting out of a room and stay on after they have begun to depart, standing first on one foot and then on the other, talking aimlessly, because they lack the decision to make a direct and graceful exit. Nowadays the use of the telephone is sufficiently general for there to be comparatively few who are unable to say "good-bye" when they have finished discussing the object of the call. Moreover, to people who use the telephone much, telephoning is work, and, as work, is to be done as quickly and directly as may be. So that there is a constantly growing number of telephone users who appreciate that a telephone message is to be got through with as quickly as possible, who avoid preliminary remarks and rigorously rule out flowery continuations of the substance of the message—who, in short, regard a telephone message as it should be regarded, as a series of spoken telegrams, requiring a condensed style.

* * *

These considerations show us that as the telephone habit spreads and takes root, the average telephone message tends of itself to become shorter, or at any rate to occupy the line for a shorter period of time by reason of more expert work in telephoning done by the public as the public becomes more practiced in the art of handling its own business by wire. There is still another reason why the average local telephone message tends constantly to occupy less time, which we will discuss in our next talk.

OPERATOR AND COMPANY

By A. L. TETU

THE treatment of an operator differs in no way from that to be accorded any other woman employee, except in so far as it becomes necessary to act as a "buffer" or protector against the whims and possible abuse of the telephone public. It is common knowledge that the subscriber at a telephone is in his worst state of impatience, seconds seeming like minutes, and minutes like hours.

To bring out the best efficiency of an operator, she must realize that the company for whom she works has an interest in her apart from the mere service she renders at the switchboard, and in turn expects a devotion which does not end with the receipt of her monthly salary. In other words, she must be made to feel that she is a part, and an *important* part, of the association by which she is employed.

How shall this feeling on the part of the operators be developed? First, by an honest and distinct understanding at the time of engagement as to what shall be expected from her, and what in turn the company will return. The operator must know that courtesy, accuracy, speed and honesty are the qualities demanded, and the company will contribute to her comfort, her physical and moral welfare, and to the betterment of her financial and worldly conditions, so far as may be possible and consistent.

Women, as a rule, are more appreciative of what an employer tries to do for them than are men. Consequently, the courtesies which it is possible to extend a young woman in business are well invested and calculated to engender this feeling of interest and reciprocity.

Exigencies of the service demand that utmost discipline prevail in the operating room at all times. It is possible to develop this degree of discipline without being harsh or severe, and if the matter is put before operators in the proper light they will appreciate the necessity of such discipline and will willingly become a part of a thoroughly disciplined organization, with corresponding possibility of advancement in position and salary. For the comfort of the operator a cozy and clean recreation room and dining room must be supplied, and with the latter tea or coffee, as may be elected. Arrangements must be made that the operator can lunch in comfort, with opportunity for rest thereafter up to the time of resumption of work at the operating board. In addition, a hospital room should be provided, toilet and wash rooms should be kept clean and well ventilated, and the entire operators' quarters, with books and papers, kept apart from the operating room and in charge of a competent matron. Individual wire lockers are necessary, and in the operating room, space, air, light, comfortable chairs, and last, but not least, kindly supervision.

In the selection of an operator, the testing of her eyesight, voice and physical reach, form important component parts of her ability to successfully develop, and there must also be taken into consideration the question of nervous temperament. A woman who is at all inclined to nervousness will never succeed, if for no other reason than that the discourtesy to which she may possibly be subjected at the hands of an irate subscriber, would tend to throw her into confusion and incidentally her neighbors. She must know that she will be protected against such abuse to the fullest extent, and, on the other hand, she must understand that no matter what may be said to her by the subscriber, her relief lies in a report to the chief operator, and not in an effort to "get back."

Operators and all other employees are entitled to recognition wherever they may be met, for courtesy under any and all circumstances goes a long way towards developing not only personal esteem, but greater interest in the work. There was a manager once who took great pride in saying that his operators "would rather go around the block than meet him on the street." On such a relation between employer and employee comment is superfluous. It is not necessary to become familiar, but the ordinary courtesy due from man to woman should not cease with the business relations, but should be extended at every possible opportunity.

The operator can make or mar the service. She is the governing point upon which the success or failure of an exchange hinges, so the personnel of the operating force contributes in the greatest measure to the general result.

A TELEPHONE PRESCRIPTION

By IRA D. COTELLE, M. D.

I PRESCRIBE a telephone for you, Mr. Brown. All the drugs and medicines that I could name, will not better your condition. What you require is to talk to your friends and acquaintances, to mingle with them as it were, just as you would were you able to do so."

This was the novel prescription I ordered one of my patients a few years ago. He was suffering from a chronic disease which, although not violent, confined him to his home. He lived in the suburbs of a large city, and had previous to his illness been a very energetic business man, and also a man fond of the society of his chosen friends and acquaintances. Although his sickness was in no wise dangerous in itself, he chafed very much over his enforced confinement. As the days passed, I saw that he was becoming weaker. He got despondent, and melancholy. I had done everything I could for him, and was almost discouraged.

One day I had been thinking of the patient and of his former habits, when it flashed on me that if he couldn't go out, he could at least telephone. We had the telephone installed, and after the first using, he was a changed man. He spent a greater part of each day calling up his friends, and at last recovered to such an extent that he was allowed to talk business matters each day



THE INVALID'S MICROTELEPHONE.

with his confidential secretary. His improvement was almost miraculous, so rapid was it. Within a month he was at his office every day, and he now is a hale and hearty man.

Since then, the telephone is my most frequent prescription. Where every means known to the science of medicine fails I still have faith in the efficacy of the telephone to work a cure. It is remarkable. In two private hospitals I have had regular telephone systems installed. They are now the best medicine chest we have.

The photograph with this article shows a convalescent patient using a telephone. The instrument I think is called a micro-telephone by telephone men. At first the conventional desk telephone was used, but this instrument was found to be the best, as it is much lighter, and easier to manipulate. It is scarcely any exertion for a patient to use an instrument of this kind, and the little exercise really does them good.

In hospitals for the isolation of patients with contagious diseases, the telephone is particularly valuable. The ordinary patients can sometimes receive their friends in the hospital. But the contagious patient cannot do this. They are completely cut off from seeing anyone except the nurses and doctors. It is terrible to be thus shut up away from home and friends. This difficulty is, however, easily solved by the telephone. The wire does not carry disease. The contagious patient can call up friends and talk to them at will or be called up by them. There is not the excitement of a visit from a friend or relative in person, and a few cheering words from a loved one, has, in my opinion, saved many a life.

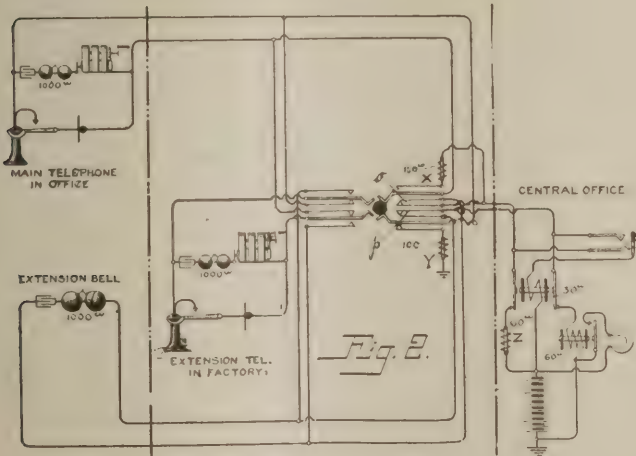
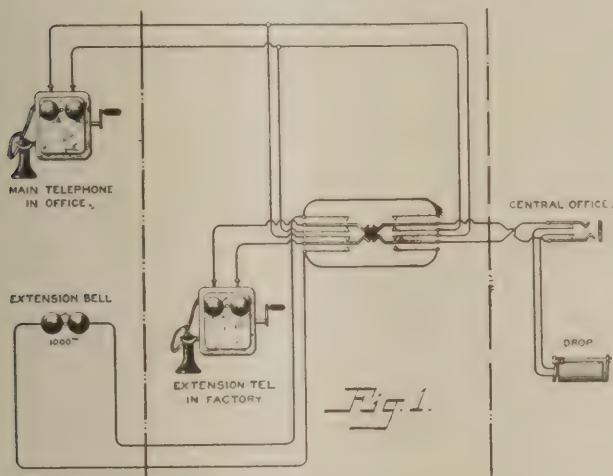
Queries

Conducted By WILLIAM W. DEAN

A PARTY LINE PROBLEM

Will you kindly give your opinion on the sketch and diagram shown, giving if possible correct diagram by which common battery may be applied to the problem?

We have a central energy, common battery system in the city in a factory and the office has been connected with the switch (diagram shown) so that we can talk to each other without signaling central, having hand generators and extra bells, and also each can talk to central by throwing cam in other positions. This worked very nicely until we changed to common battery, but we find that it is necessary to maintain local battery at each of the telephones for the reason that when office wants to talk to factory, they would have no battery and vice versa unless switch was left in one position so as to bridge extra set on line and call each other by push button, and, of course, central



would come in and answer, her light having shown up when they would be talking.

What I want to do is to use some kind of switch or relay by which they work on common battery as independently as they can with local battery. Of course, it will be necessary to use hand generators to call each other, but these can be bridging style and talk to each other without control light showing up. This is the switch as it is on local battery. (See Fig. 1.)

When cam is thrown to right, the office telephone talks to factory privately. When thrown to left, it closes contacts at B and office telephone talks to central privately. When left in center position, either factory or office can talk to central. This extension bell is bridged on line at office so it rings, no difference how cam is thrown.

G. W. L.

Fig. 2 shows a system for doing the same work as that shown in Fig. 1, except that it applies to a common battery system. In this system the line relay is inserted in the ground side of the battery. On the live side of the battery a 60 ohm retardation coil z is inserted. At the subscriber's station two retardation

coils x and y of 100 ohms each are connected, as shown in the sketch. When the switch is in the central position, as shown in Fig. 1, two common battery stations are simply connected to the line in the usual manner and the extension bell is disconnected by the opening of the contacts o and p . When the switch is thrown to the left, the extension telephone is disconnected from the central office line and is connected to the extension bell. When the switch is thrown to the right, both telephones are disconnected from the central office, but are connected for intercommunication in the following manner:—battery will flow from the central office through the retardation coil z , the sleeve side of the telephone line, through retardation coil x , through both the main and extension telephone, through the retardation coil y to earth.

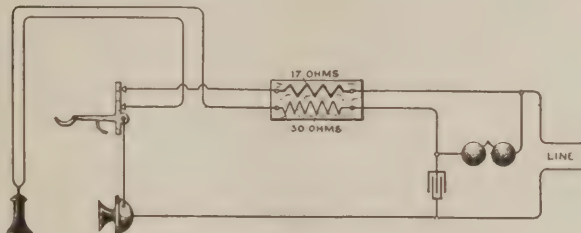


Fig. 3.

It will thus be seen that the two subscribers are supplied with current for intercommunicating without effecting the line relay at the central office. During the time that the switch is thrown to the right for intercommunication the 1,000-ohm extension bell will be connected to the central office line by means of the contacts o and p so that the central office will be able to ring up the main station.

COMMON BATTERY INDUCTION COIL

Will you please describe the theory of action of a common battery induction coil when the set is wired, as in the enclosed diagram (Fig. 3)?

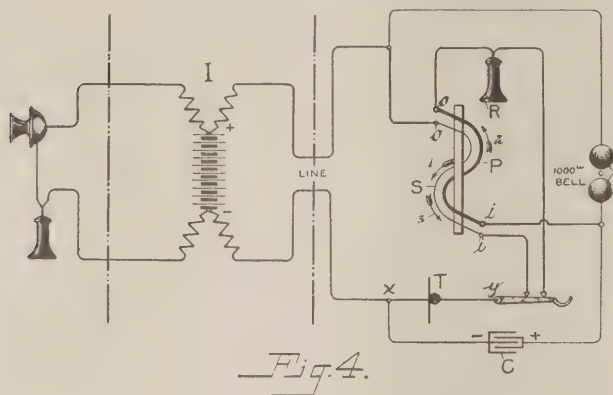
W. C.

The circuit which you wish described is the one used in the common battery systems of the American Bell Telephone Company.

In order to more fully illustrate the action of this circuit it has been drawn as it is actually connected (see Fig. 4). The secondary coil of the induction coil S measures 17 ohms, and has 1,700 convolutions of wire; the primary circuit P measures 30 ohms and has 1,400 convolutions of wire. The ends of the primary and secondary coils, marked o , are the outside ends and the ones marked i are inside ends; both coils are wound in the same direction on the core. The action of this circuit is as follows: Suppose the transmitter T is at rest and has a certain fixed resistance. Current will flow from the positive side of the battery over the line through the secondary winding of the induction coil in the direction of the arrow No. 1, through the hook contact, transmitter T , to the other side of the line, to the negative side of the battery. Between the points x and y there will be a certain electrical potential, the condenser C will be charged to the same potential that exists between the points x and y and the direction of this charge will be as indicated in the sketch. In speaking into the transmitter T , a sudden lowering of its resistance is caused. The potential between the points x and y will be reduced; in other words it will be lower than the charge existing in the condenser C . A discharge will now take place from the condenser through the primary P of the induction coil, through the receiver R , the hook, the transmitter T to the negative side of the condenser. This discharge of current will be in the direction indicated by arrow No. 2. The flow of the current through the primary P , as indicated, will cause a current to be induced in the secondary winding S , in the direction of the arrow No. 3. This current on account of the "step up" effect of the induction coil will be of a higher potential than the original current and, as it is in the same direction as the current indicated by arrow No. 1, will augment it. When the transmitter T returns to its normal position, the potential will be again raised between the points x and y . Current will, therefore, flow

into the condenser from the point *y* through the hook to receiver *R*, through the primary winding *P* in a direction opposed to arrow No. 2, to condenser *C* to the point *x*. An induced current will be generated in the secondary *S*, in a direction opposed to arrow No. 3. This current will oppose the main line current flowing in the direction of arrow No. 1, but on account of the increase in resistance of the transmitter *T*, this current is on the decrease, and the last mentioned induced current will still further tend to decrease it. It will thus be seen that the current changes taking place in the telephone line are of much greater range than they would be if induction coil were not used.

In order to prove that the action of the coil augments the transmission, connect a switch so that the terminals of the secondary coil can be instantaneously reversed or in other words, change the relative positions of the points *o* and *i* of the coil *S*, and a difference in volume of transmission of about 50 per cent. will be noticed.



PARALLELS A TROLLEY LINE

The telephone company here has a plant of 180 subscribers, common return system, with two metallic toll or trunk lines connecting other towns. There is a trolley line being built through our town parallel with our line, a distance of eight miles. Most of the way the trolley wires will not be more than six feet away from our lines and part of the way the two feed wires will not be less than 12 to 14 inches, while their trolley wire will be about four feet. What will be the effect on our system? Can we operate with our common return or must we change to metallic, or must we get further away? If so, about how much? G. A. M.

Without doubt bad induction will be had with the conditions as explained. It was a great mistake to allow the railroad company to place its wires in such close proximity to the telephone line. In order to be free from induction under these conditions, it will be necessary to change the system to straight metallic circuit and also to carefully transpose all of the lines in accordance with the method described in standard works on telephony.

By keeping the return ground absolutely free from actual contact with the earth, the line may work fairly well, but if at any time the common return wire becomes grounded, the system is certain to be inoperative.

CROSS TALK PROBLEM

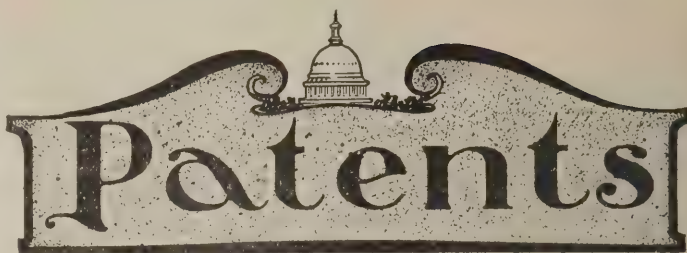
Where a grounded line parallels a metallic circuit on the same pole, will there be cross talk?

If the metallic circuit telephone line is transposed there will be no cross talk between it and the grounded line.

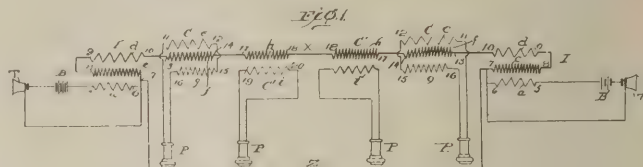
ABOUT BRIDGING TELEPHONES

To what extent and under what combinations can bridging or legging be done, grounded or metallic? H. N.

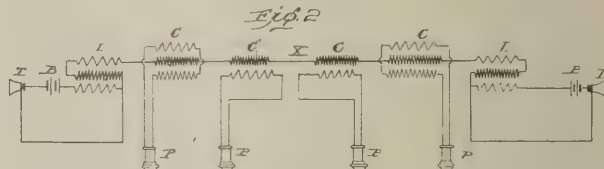
For practical purposes it is not well to place more than twenty-five stations on a line. The number of stations which can be successfully operated depends largely on the insulation and resistance of the line. A man some time ago had 103 telephones on two lines and wanted to know whether it would be best for him to buy a telephone switchboard. Needless to say, he was advised to buy.



Chas. G. Burke, of Brooklyn, N. Y., patents (No. 713,744) a telephone system. The device is shown in Figs. 1 and 2. The transmitters *T* and *T'* are furnished with a local battery in the

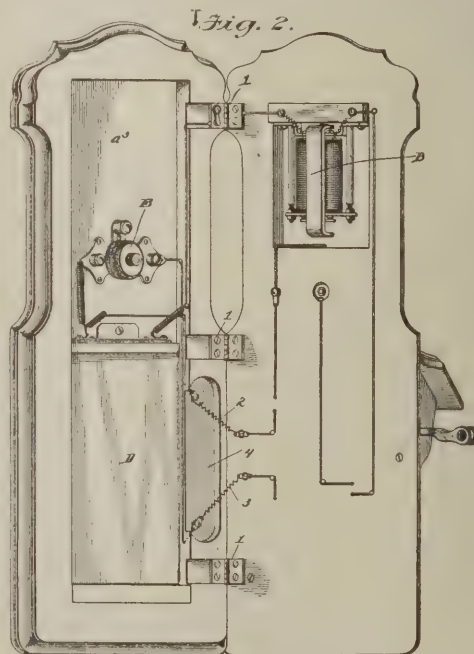


usual manner, and in addition a peculiarly wound induction coil, consisting of three windings, one of which, *a*, is in the transmitter circuit, while the other two are in the line circuit. Various receivers along the line are similarly supplied with special coils.

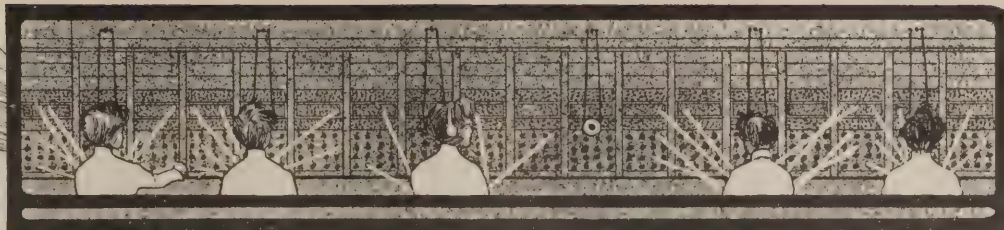


By this means the inventor claims improved transmission. In Fig. 2 this arrangement is shown without the return wires *z*, and it is claimed that by means of this arrangement telephone messages may be sent from place to place upon a single wire without the use of any return, ground, or otherwise.

Ernest E. Yaxley, of Chicago, patents (No. 713,829) a telephone. An elevation of the device is shown in Fig. 2. From Fig. 2 it will be seen that the back board *A* is provided with a recess *a* and a cover *5*. It is of the usual shape customarily seen in a wall instrument. The recess is hollowed out in such a manner as to provide space in which the condenser and its terminals may fit, and the



projecting parts of the ringer. Upon the door *5* the transmitter, ringer and switch hook are mounted in the usual manner. In this way all apparatus on the wall is made exceedingly compact and presents an attractive appearance, otherwise there is no novelty in this device.



The Operating Field

A LONG DISTANCE FEAT.

ANOTHER triumph for the long distance telephone over the telegraph was won in reporting the great football game between Michigan and Minnesota from Ann Arbor to Minneapolis and St. Paul on Thanksgiving Day. The *Minneapolis Tribune*, under the heading "Fine Service by Telephone," gives the following:

"A most marvelous and interesting side feature of the big football game yesterday was the fact that every detail of the contest in Ann Arbor was known by the thousands in front of the *Tribune* building, 700 miles away, as soon as by the thousands assembled in Ferry field.

"The indications on the *Tribune's* diagram were practically simultaneous with the plays they recorded. But a few seconds elapsed between the event and the report. The Michigan crowd and the Minnesota one cheered together.

"Its absolute success proves conclusively that for long distance reporting the telephone is greatly superior to the telegraph.

"The *Tribune* also made arrangement yesterday with the Western Union Telegraph Company for a special wire from Ann Arbor. Its bulletins were constantly from fifteen to twenty minutes behind those of the telephone company and after a short time its service was discontinued.

"Not only is the telephone service much quicker and surer, but when a mistake or misunderstanding does occur it can be righted instantly by a question from the person receiving and an answer or repetition by the sender."

To obtain the result above stated, the telephone company placed a sound-proof booth on the top of the grand stand, where a complete view of the field was possible. Two newspaper men were given the places at the instruments at Ann Arbor and also Minneapolis, while telephone men were on hand to give any assistance needed. Cord circuits were avoided as far as possible, the instruments at each end being connected directly to the line. Three Fuller cells were used for battery at Ann Arbor, while dry cells were used in Minneapolis. The elements favored, and the transmission was excellent. The circuit was somewhat round-about, so that its length was about 850 miles. A conception of the transmission can be had from an incident which occurred. The reporter at Ann Arbor, trying to distinguish between two players, made the remark aside, "Those fellows both have black hair, and I can't tell them apart." This was distinctly heard in Minneapolis.

As stated by the *Tribune*, the telephone has the advantage of righting a mistake instantly. And it was of most vital import in this case; for on several occasions the "rooters" at home were told "Minnesota carries the ball for — yards gain." Immediately someone would ask, "Who made that play?" The question was sent back, and received the name of the player instantly in reply.

As the game progressed, the men in the telephone booth were greatly amused at the frantic efforts of the Associated Press reporters to hurry their messages. The reporter at the telephone became so enthusiastic that he sandwiched between his football bulletins, "We've got the *Despatch* skinned ten minutes easy." The time element was but one of the many issues that made this experiment the great success that it was. Every detail of the game was given, name of the player, and whether he punted, ran, was injured, gained or lost distance, was carried off the field, the appearance of Minnesota people on the field at every play, and the way the betting stood at all points.

A MONOPOLISTIC EXAMPLE.

IN a desperate attempt to knock out the Los Angeles Home Telephone Company, the Sunset Telephone and Telegraph Company has filed in the Superior Court a suit against the Home Telephone and Telegraph Company, in which it claims that the latter secured its franchise from the City Council illegally.

The Sunset company asks that this franchise be declared null and void and that the court issue an injunction prohibiting the Home company from erecting any more poles or stringing any more wires which will in any way interfere with the property of the plaintiff.

In the voluminous complaint filed, which consists of over twenty-five closely written pages, the plaintiff sets forth all the reasons of the complaint which it has against the Home company except the right and principal one.

It states that on November 16, 1901, the City Council granted the plaintiff a franchise by passing an ordinance giving it the right to do business in Los Angeles for twenty-five years, string its wires and erect poles.

The electric currents over these wires, says the complaint, "have a voltage of an inappreciable and infinitesimal fraction," that its instruments are delicate and sensitive.

The plaintiff says that in the operation of the thousands of its wires, care must be taken not to have them come in contact with other wires or they would be damaged.

The Home company, continues the complainant, began setting up poles last June, and it gives a list of the streets in which the Home company wires are already strung.

Most of the wires and poles of the Home company, says the plaintiff, interfere with the Sunset company's wires to its injury, and that this causes the wires of the plaintiff to become bunched and crossed, to remedy which the defendant has "buttoned" the wires to the poles.

The Home company, says the Sunset company, has shown no consideration for the rights of the plaintiff.

In conclusion the plaintiff asserts that if the defendant is allowed to proceed in the construction of its lines it will be a menace to the property of the plaintiff and to the lives of its employees and to the citizens of this city.

The Sunset company asks: "That said pretended franchise of defendant be adjudged and declared to be null and void."

The plaintiff also asks for an injunction, "pendente lite," to prevent the defendant from erecting poles to interfere with the plaintiff.

IOWA SITUATION.

THE Trades Assembly of the city of Burlington, Iowa, has just decided to oppose an application for a franchise presented by the Modern Electric Company. Burlington has a Bell exchange in the city, and also a small Independent system, but by neither of these does it get more than a local service. It is cut off from all neighboring Independent systems, and in this territory the Bell only has toll stations—no exchanges. The following statistics have been printed, showing the telephone status in this section of Iowa and what the people of Burlington will receive in the way of telephone facilities in case a franchise is granted to the Modern Electric Company:

An Independent company at New London has a large town exchange and about two hundred farmer subscribers, and toll line connections with a number of towns both north and south. The Bell company has a toll office only. At Mt. Pleasant the Inde-

pendent company has an exchange of almost three hundred subscribers, which is growing as rapidly as telephones can be placed, and between one and two hundred farmer subscribers and toll line connections with every town in Henry county. The Bell company has a small exchange in the city of Mt. Pleasant.

At Fairfield the Independent company has an exchange of four hundred subscribers, about one hundred and fifty farmers and toll line connections with every postoffice in the county. At this point the Bell company has an exchange of not to exceed fifteen subscribers, and there are but one or two business houses in the town using the Bell telephone.

At Washington the Independent company has an exchange of about four hundred subscribers, toll line connections with every town in the county, and between one and two hundred farmer telephones. At this point there is no Bell exchange whatever, simply a toll office.

At Siguorney, the Independent exchange has almost three hundred telephones and toll line connections with almost every town in the county, and a large number of farmer telephones. At this point the Bell company has only a toll office.

In the city of Ottumwa the Independent exchange has 1,125 subscribers and toll line connection with every town in the county. The Bell company has here an exchange of 375 subscribers.

At Centerville there is a large Independent exchange of over four hundred, and toll line connections with every town in that county, and the Bell people have a toll office.

At Bloomfield, the Independent exchange has over three hundred subscribers, with toll line connections with every town in Davis County and a large number of farmer telephones. At this point the Bell has only a toll office and no exchange.

Danville, Iowa, has two hundred Independent subscribers, and only a Bell toll office.

At Keosauqua, there is a good sized Independent exchange, with toll line connections with every town in the county and a very large number of farmer telephones. And throughout the county there are a number of Independent companies extending into Lee and Louisa counties, and connecting with some of the Independent companies above referred to. There are exchanges at West Point, Farmington, Wever, Olds, Yarmouth, Mediapolis and numerous other places. In fact, Independent telephone companies control the telephone business in the south three tiers of counties across the State. In all these counties there is not a single county seat which has not a large Independent exchange, with the single exception of Council Bluffs.

In all this territory the only exchanges operated by the Bell company are a small one at Mt. Pleasant, a very small one at Fairfield, the exchange at Ottumwa, and one at Red Oak. In every other county seat in this territory the Independent people have absolute control. In addition to the Independent exchanges in the county seats, almost every county in the territory named has from two to five other exchanges located in the smaller towns, with each of which there is connected a large number of farmer subscribers, and all connected into the county seat.

In the territory tributary to Burlington, the Independent people have for a long time felt the need of connections with the business men of Burlington. A company is now organized which proposes to build a long-distance copper toll line extending from Burlington across the State to Council Bluffs, with Des Moines connections. This company has a contract with the Modern Electric Company for its Burlington connections, provided a franchise is granted. It is the intention to construct at once two copper circuits along the line of the C., B. & Q. Railway across the State. This company, after repeated efforts, failed to be able to make a contract with Mr. Hubinger, the owner of the Independent exchange in Burlington, and, of course, could not and would not contract with the Bell.

If the right is granted the Modern Electric Company to place a telephone exchange in the City of Burlington, every single business house in the city is assured direct telephone connections with every retail dealer in Southeastern Iowa. The value of such a telephone connection to the business men of Burlington can scarcely be estimated.

The town of New London has to-day Independent telephone connection, rendering a good service with every town in the counties of Henry, Washington, Jefferson, Van Buren, Keokuk, Wapello and Davis extending as far north as Iowa City and Cedar Rapids northwest to Oskaloosa, Knoxville and Des Moines, and west to Creston. With the present toll line system this service may not be in all cases the best, but it is being rapidly improved, and in the very near future the service will be as good as that rendered by any other company.

If the franchise asked for by the Modern Electric Company is granted, Burlington can have every connection that the town of New London now has.

In all the cities and towns above named, Independent exchanges are furnishing a better service than the Bell has ever furnished at any of the places named, and they are furnishing service at less than one-half of the rates formerly charged by the Bell company. And in almost every instance these exchanges are owned and operated by local companies interested in their own city and town, and who keep and expend in that city and town every dollar paid out for telephone service. This is what the Modern Electric Company, of Burlington, Iowa, proposes to do for its own city.

GROWS FROM 4 TO 215.

S EVEN years ago in the village of Belmont, N. Y., a few business men organized a company and connected their residences with telephones, putting in four telephones in all. Since then that organization has developed into the Citizens' Telephone Company. At present the company has 250 miles of wire and 215 telephone connections, covering the vicinities of Scio, Philip's Creek, Withey, Ward, Baker Factory, Middaugh Hill and Belvidere, in addition to Belmont. Under the direction of its officers, W. P. Clark, president; H. A. Barney, vice-president; James H. Anderson, manager, and Dr. W. J. Hardy, treasurer, there has been \$9,000 invested. New lines have just been completed to Scio. Since the consolidation of the two companies—the Belmont and the Citizens—the service has been much improved.

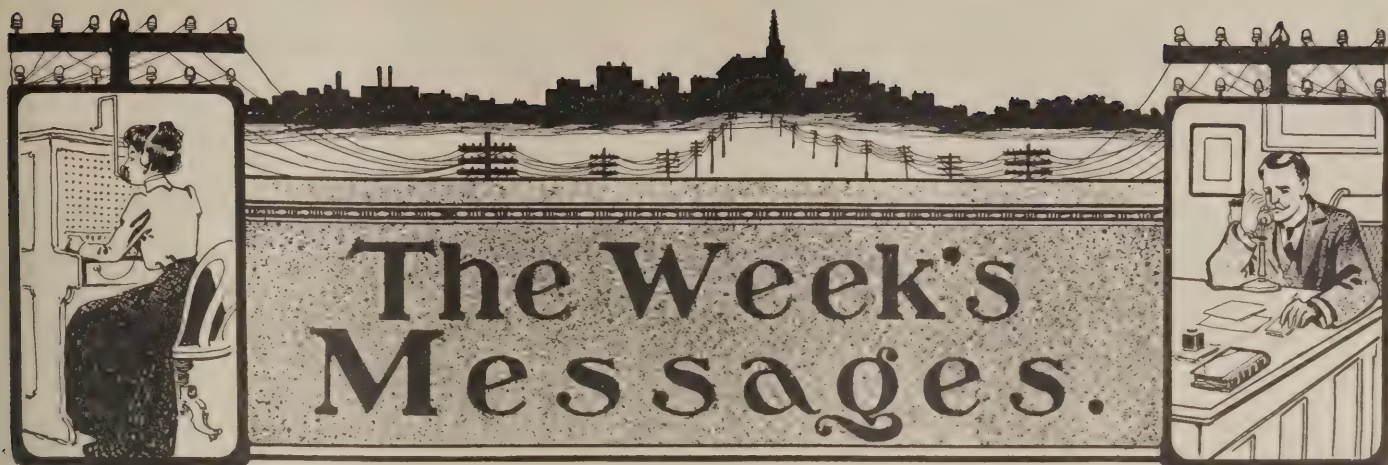
LONDON-BELGIAN TELEPHONE.

O WING to the unsatisfactory nature of the trials of the London-Brussels telephone from the Belgian side with English provincial towns, a delay has occurred which was not anticipated, and it is probable that, instead of the new line being opened to the public immediately, as had been expected, it will be only during the first months of next year that the line can be employed for regular service. The line would long ago have been inaugurated were it not for the unfortunate accident that occurred when the cable was being laid in the first instance, says the *London Electrical Review*. It was then discovered that the cable was defective, a break having occurred. The terminal points of the submarine section of the cable are St. Margaret's Bay, near Dover, and La Panne, on the Belgian coastline. The entire work of laying the cable was carried out under the jurisdiction of the English Post Office Department, by its two vessels, the *Alert* and the *Monarch*. The cable is the longest of its kind that has yet been laid, being 90 kilometres in length. It comprises two circuits, and cost nearly £40,000. The complete installation will cost about £80,000, which will be equally shared by the two nations. From and to Belgium communication will only be feasible with Antwerp and Brussels. If communications are numerous, however, and the new line proves profitable, the Belgium Government will instal connections with the other principal Belgian towns. In Brussels it will be possible for subscribers to the Post Office telephone to communicate with London from their houses. In Antwerp, however, owing to the imperfect nature of the local telephone system, this will not be possible. The rate for messages has been fixed by agreement between the two governments at 8s. or 10fr. for three minutes' conversation. No subscriptions will be issued either in England or Belgium. The day and night tariffs will be the same. The cost of maintenance of the new line will be borne in equal parts by the two governments.

A NEW ASSOCIATION.

R EPRESENTATIVES of sixteen Independent telephone companies of northeastern Iowa met at Waterloo recently. An association was affected under the title of the Northeastern Iowa Independent Telephone Association, and the first set of officers was chosen. They are: President, Dick Stevens, of Dubuque; vice-president, Mr. VanVoorhies, of Independence; secretary and treasurer, Stanley S. Lichty, of Vinton.

The principal object of the Association is for the better facility of connections, the cultivation of a fraternal and helpful spirit instead of one of animosity among the Independent companies, and to regulate toll rates.



NEW COMPANIES.

LITTLE ROCK, ARK.—The Tate Mill and Little Rock Telephone Company has been incorporated. The proposed line is twenty-five miles long, running from Tate Mill to this city via Warsaw, Macon, La Conte, Jacksonville and McAlmont. The incorporators and officers of the new enterprise are Dr. J. T. Rooker, Warsaw, president; W. M. Tatum, of Jacksonville, secretary; E. J. McBride, of Jacksonville, treasurer; D. F. Peters, vice-president, and Berry W. Woods, constituting the board of directors.

SAN FRANCISCO, CAL.—The Direct Line General Telephone Company, principal place of business, San Francisco, has been incorporated. Directors: J. Finch, A. G. Andriano, W. T. Hess, J. Fay and C. E. Wiggins. Capital stock, \$2,500,000; subscribed, \$100,000.

PROWERS, COLO.—The Big Bend Rural Telephone Company has been incorporated with a capital stock of \$10,000. Directors: Arthur Carver, Carle W. Burke, Charles Carver, Fred W. Lamson, E. C. Gordon, R. A. McKibben, Fred Williams, Elmer J. Wagener, J. O. Stream; to operate in Prowers, Bent and Otero counties; office, Prowers County.

BYRON, ILL.—The Byron Telephone Company has completed its organization with S. B. Shuart as president of the company, F. A. Nott, secretary and general manager, W. H. Mix as treasurer, and these three gentlemen, together with George F. Bunn and Joseph Stevens as directors. Work on the construction will begin at once and the poles for the line are already ordered and the rest of the supplies will be ordered at once. The majority of the stock was taken in town. L. R. Spalding will have charge of the construction of the line and will be in charge after it is built.

LEE, ILL.—Work on the new telephone line that is to run west from Lee has been commenced. The central office will be in Lee and will be operated in connection with the local central of the DeKalb County line. It will be known as the Lee Independent Telephone Company, and will be managed by Dr. Munn.

FARMERSBURG, IND.—The Hayworth Telephone Company has been organized, and will connect with the Mutual Telephone Company. The directors are Andrew Thompson, Thompson Scott and Edward Gaskins. Of these directors Andrew Thompson is made president, Thompson Scott secretary and Edward Gaskins treasurer.

JEFFERSONVILLE, KY.—Steps are being taken to organize an independent telephone company in Jeffersonville. Representatives of the Louisville Home Telephone Company were here recently urging a number of influential business men to revive the Home Telephone Company and to proceed at once to construct a line, so that operations could be begun as soon as possible. Considerable enthusiasm has been worked up and the Louisville company has offered to connect its line with the one on the Indiana side if built, and make a desirable arrangement for the interchange of business. A meeting will be called soon, when the question will be thoroughly canvassed. The Home Telephone Company of Jeffersonville now holds a franchise, which was granted some five years ago, that is still operative, and no action of the city council would be required to go ahead with a line. After the franchise was secured it was found the company could not make a satisfactory arrangement with the Ohio Valley Telephone Company for connection with Louisville, and since that time nothing has been done.

OWENTON, KY.—The Owenton Telephone Company has been incorporated with a capital stock of \$7,500. J. U. Connvach, June Gaybe, J. A. Johnson are the incorporators.

BLUE EARTH, MINN.—The business men and farmers of Guckeen and vicinity met here recently and organized the Guckeen and Blue Earth Telephone Line. They elected Alfred Willett, president; J. C. Sullivan, secretary, and Fred Merrill, treasurer. Mr. Colvin, manager of the Blue Earth Valley Telephone Company, came down to this city and met with them. He agreed to order all material necessary for them. They are to have the latest improved and best telephones in the market. They will connect with the local telephone company. There will be quite a number of side lines constructed. The work of setting the poles commences at once and the line will be completed as rapidly as possible. Guckeen has one farmers' line and another assured.

SALAMANCA, N. Y.—The Salamanca Home Telephone Company has

been incorporated with a capital stock of \$10,000. Directors: G. E. De Golla, Jennie R. De Golla and B. L. Andrews, of Salamanca.

TIGARDVILLE, ORE.—The Tigardville Telephone Company has been incorporated with a capital stock of \$1,000, to construct and operate telephone lines, etc. John Gaarde, C. F. Tigard and E. J. Goodman are the incorporators.

WILLIAMSPORT, PA.—The Interstate Development Company, of this city, has been incorporated with a capital stock of \$200,000. Its purpose is to acquire telephone and telegraph lines.

BRADFORD, VERMONT.—The Bradford Telephone and Telegraph Company has been incorporated to operate a telephone and telegraph system.

ELKMOUND, WIS.—The Elkmound Telephone Company has been incorporated with a capital stock of \$5,000. Incorporators: C. A. Silkworth, W. A. Mau and J. E. McCoy.

KENOSHA, WIS.—Articles of incorporation have been filed for the Citizens' Telephone and Telegraph Company of this city, with a capital stock of \$50,000. The new company is backed entirely by local capitalists, and is the outgrowth of the agitation that has been going on here for some time. The incorporators are: George A. Yule, Charles C. Brown, John C. Slater, Nicholas J. Werner, J. H. Corcoran, H. B. Robinson and James Cavanaugh.

LEGAL.

TAHLEQUAH, I. T.—J. W. Zeverly, acting Indian Inspector, has issued notice that all companies or individuals operating telephone lines in the Indian territory who have not already procured proper authority therefor and complied with the provisions of section 3 of the Act of Congress approved March 3, 1901 (31 Stats. 1083) will be required to file applications and otherwise comply with the regulations of the department. It is said that there are now some thirty lines which are operated without the proper authority.

FINANCIAL.

LEXINGTON, KY.—A mortgage has been filed here by the Independent Long Distance Telephone and Telegraph Company, to the National Trust Company, of Louisville, in trust to secure the issue of \$1,000,000 5 per cent. first mortgage gold bonds for thirty years from January 1, 1903. The property mortgaged includes the Louisville plant and the lines with all branches and equipment in Louisville, State of Kentucky and Indiana.

PORTLAND, ME.—The Northeastern Telephone Company has issued a call to its stockholders for a return of all the outstanding shares and new certificates will be given in exchange.

ELMORE, O.—The Ottawa County Telephone Company of Elmore has increased its capital stock from \$30,000 to \$36,000.

PHILADELPHIA, PA.—President Robert H. Foederer, of the Keystone Telephone Company, announced that the preferred stock still unissued will not be issued, and that a loan, probably not to exceed \$2,000,000, will be negotiated to complete the company's equipment in Philadelphia. Bonds for the loan have been underwritten.

COMPETITION.

WASHINGTON, PA.—The Federal Telephone Company is rapidly completing the installation of its service in Washington and vicinity, and the indications are that a first class service will be furnished to the patrons of this company very soon. The company has installed 61 telephones in Washington, and it is expected that many more will be placed in a short time. The system has connections in many points in Washington County, and a force of men is engaged in pushing a line into Greene County, and soon Waynesburg will be on a direct line from Washington. Monongahela, Finleyville and Canonsburg are already experiencing a good service, and the lines have been completed and connected to McKeesport. The Federal Company promises to be a strong competitor to the Bell system. The farmers are showing their appreciation of a promised good telephone service, by giving willingly the necessary rights of way for the establishment of the lines. Company officials state that the line will be completed to Pittsburg by the first of the year, and a first class long-distance service be given. It is predicted that the Bell Company's patronage will suffer seriously.

THE WEEK'S MESSAGES

Continued.

ELECTIONS.

HILLSBORO, ILL.—A meeting of the stockholders of the Montgomery County Telephone Company was held here recently. C. W. Bliss was elected chairman and A. M. Howell acted as secretary. The following directors were elected for the ensuing year: A. M. Howell, J. J. Frey, James H. Ward, Mrs. Anna G. Carstens and C. W. Bliss. The directors elected officers for the ensuing year. C. W. Bliss was elected president, James H. Ward, vice-president; A. M. Howell, secretary and manager, and J. J. Frey, treasurer.

ROBINSON, ILL.—Elvin Gardner was elected president of the Robinson Corners and Town Line Telephone Company at a recent meeting.

KANSAS CITY, MO.—The stockholders of the Home Telephone Company have authorized the construction of a three-story brick building to be used as a central station. Directors for the new company have also been elected. They are Henry Koehler, Jr., president of the Germania Trust Company of St. Louis; Henry Koehler, attorney for the trust company; E. L. Benoist, also of St. Louis, and an officer of the same company; A. W. Lambert, of St. Louis; Arnold Kalman, J. J. Heim, Hugh C. Ward, J. J. Swofford, Walter S. Dickey, E. L. Barber, O. C. Snider and J. S. Brailey, Jr.

FRANCHISES.

ROCKWELL, IA.—The County Telephone and Telegraph Company has been granted a franchise to construct and operate a telephone exchange system here. The franchise extends until 1927.

SLOAN, IA.—The town council of Sloan has set December 12 as the date for a special election at which the voters of the town will decide whether the Sloan Telephone Company shall be awarded a franchise.

MIDDLEBORO, MASS.—The Taunton Telephone Company has asked for a franchise to locate and do business here. The company will put wires on poles or underground, as preferred. It is the intention to give service to Brockton, Taunton, Providence, Fall River, New Bedford and Middleboro.

WYMORE, NEB.—W. G. Francis and C. W. McNeel, of Kansas City, and Charles Blakely of Beatrice, were in the city recently looking over the town with a view of securing a franchise for an Independent telephone company. They propose to organize and place part of the stock in the hands of local capitalists and the purpose will be to connect all the towns and farms in Gage County.

CARTHAGE, O.—The Cincinnati and Suburban Telephone Association has applied to the Carthage council for the right to erect poles and maintain lines through the streets and alleys of the village. It is said that the company intends to place an exchange either in Carthage or Elmwood Place in order that it can accommodate its patrons in the lower end of the valley.

MORRISVILLE, PA.—An ordinance has been presented to the council authorizing the Keystone Telephone and Telegraph Company to string long-distance wires here. It was taken up and passed on first reading. The company guarantees service equal to that of the Delaware and Atlantic Telephone Company and rates forty per cent. cheaper, and to give a rate of fifteen cents to Philadelphia.

DALLAS, TEX.—F. B. Lloyd, of Wilkesbarre, Pa., representing an Independent telephone company is here and will make application to the city council for a franchise to construct and operate a system here.

TERRELL, TEXAS.—At a special meeting of the city council a thirty-year telephone franchise was granted to C. T. McCreery, of St. Louis; R. W. Wertham, of Paris, and T. R. Bond, of this city. Work is to begin on the construction of the system not later than June 1, 1903, for which a forfeit of \$100 was deposited. The company will be incorporated as a local enterprise. A complete central energy system is to be installed, and local and long-distance service furnished. No party lines will be used.

SMITHVILLE, VA.—The charter of the Smithville & Drakes Branch Telephone Company has been amended, and the name changed to the Central Telephone Company. The company has also been granted permission to extend its lines into the counties of Campbell and Appomattox.

WYTHEVILLE, VA.—The Wythe County Mutual Telephone Association, recently incorporated, has asked for a franchise to construct and operate a telephone system in Wytheville. This company already operates several lines in the county.

JEFFERSON, WIS.—Application has been made to the common council by Frank P. Mansfield of Lake Mills, Wis., for permission to construct and operate a telephone exchange in Jefferson. There is now only one exchange, the Wisconsin Telephone Company.

RACINE, WIS.—The Citizens' Telephone Company of this city has been granted a franchise by the county board to erect poles and wires, extend lines and operate a system in Mount Pleasant.

COMBINATIONS.

BEEBE, ARK.—The Beebe Telephone Exchange has been sold to Mr. John Bittle, of Heber.

RUSHVILLE, ILL.—A meeting of Rushville business men was held recently to discuss the question of uniting all the telephone lines in one union exchange with a view to better and more extended service. To arrive at some definite understanding with the different telephone companies a committee of five was appointed to interview the different managers and get their views on the question. The committee is: J. W. Lickey, L. A. Jarman, Chas. B. Griffith, H. T. Pemberton and A. P. Rodewald. One solution of the question has been offered, and it will no doubt be presented to the managers of the farmers' lines. That is for Rushville business men to build a co-operative line inside the city limits and connect with other lines coming into the city on a basis that would be fair and equitable to all concerned.

NIAGARA FALLS, N. Y.—The Niagara County Home Telephone Company, which is a merger of the home telephone companies of the Tonawandas, Niagara Falls and Lockport, held its first meeting recently and elected the following officers: President, Dr. W. R. Campbell, of Niagara Falls; first vice-president, Albert R. Smith, of North Tonawanda; second vice-president, W. T. Ransom, of Lockport; secretary and treasurer, F. H. Surde, of Niagara Falls. After Jan. 1 the principal office of the consolidated companies will be located in this city.

ANETA, N. DAK.—The North Dakota Telephone Company, which was organized here last year by C. E. Burgess and C. F. Moody, has been re-organized. The grain commission firm of Edwards, Wood & Company, of Minneapolis, has purchased the controlling interest in the company, having taken \$15,000 worth of stock. At a meeting of the stockholders held in Northwood the following officers were chosen: Geo. B. Wood, president; L. A. Wood, vice-president; R. H. Edwards, secretary and treasurer. Messrs. Burgess & Moody will still be connected with the company as stockholders. This company already has a metallic line from Mayville to Devil's Lake and Starkweather, and the work of construction will be continued next spring. Work on the Aneta exchange has begun and will be completed in about six weeks.

HOUSTON, TEX.—F. C. Smith and H. E. Huntington have purchased the Citizens' Telephone Company. The syndicate, at the head of which are these gentlemen, now control the Independent exchanges at Memphis, Houston and Corsicana. They are also interested in other exchanges and have a traffic agreement with the Lone Star and Commercial Telephone Companies, operating long-distance lines. All of these companies are in opposition to the Southwestern Telegraph and Telephone Company. Mr. Smith says that the entire Texas field will be covered with Independent telephone systems, and that the building of long-distance lines would be one of the features.

CONSTRUCTION.

FOREIGN NOTE.—It is announced from Washington, D. C., that capitalists of New York, Boston and Pittsburg have obtained a contract to construct a telephone system in Iquitos, Peru, a city of about 20,000. A similar contract is said to be pending with Manaos, Brazil, a city of about 40,000 on the upper Amazon.

ARGO, ILL.—The material for the town system of the Argo Mutual Telephone Company has been ordered by Dr. Skinner, and will soon be ready for use. It will give connection with all the lines of the rural telephone and includes Eldridge, Long Grove and Princeton, with a connection with the Independent system in the spring.

BADERS, ILL.—The Baders Telephone Company is planning to add another line to accommodate the increased demand for telephone service. The line is now completed to Browning.

EDWARDSVILLE, ILL.—The Kinloch Telephone Company, which has had only a toll station in this city, is making preparations to construct a complete exchange.

PROVIDENCE, IND.—The Providence Telephone Company is running lines out from the main connecting line to give service to many country places. The line connecting Franklin with Providence switchboard has been completed.

BLAIRSBURG, IA.—The Stafford Telephone Company has been giving excellent service, and is improving and progressing right along. A modern switchboard has just been ordered and will be put in soon. All subscribers in the town will also have private telephones. A west line is being constructed and an east line is contemplated.

BURLINGTON, IA.—Work is being pushed rapidly in the construction of the Burlington-Augusta Telephone system, articles of incorporation of which were filed several weeks ago. The company is capitalized for \$3,000, has sixty subscribers and twenty-seven miles of wires. The new system will be completed by the middle of next month and will connect with the Mississippi Valley Central. The board of directors consists of E. W. Rankey,

THE WEEK'S MESSAGES Concluded

president; Henry Magel, vice-president, and Nels Hanson, secretary and treasurer.

BOWLING GREEN, KY.—At an extra session of the city council, the bond of the Southern Electrical Construction Company was approved. This company is to build an Independent underground telephone system here. Work will commence at once.

WESTBROOK, ME.—The Westbrook Telephone Company recently granted a franchise here, held a meeting and considered plans for the construction of its pole lines, central station, etc. Alexander Spiers, the treasurer of the company, is now engaged in obtaining the cost and most approved instruments and installation for the service required for local use. The detail work will be planned this winter, and the matter of the construction of a pole line and the equipment of a central station will not commence until next spring, now that the season is so far advanced, making it impracticable to work this winter.

FREDERICK, MD.—The Frederick County Telephone and Telegraph Company, which during the past six months constructed many miles of telephone lines in the county, is now building a line to Burkittsville, connection with which place will soon be opened. Through an extension of the Maryland Telephone Company, of Baltimore, to York, Pa., the local company now has connection with the latter and with Columbia, Pa.

COLDWATER, MICH.—The Himebaugh Telephone Line, operated in Bronson, Burr Oak, Noble, Matteson and Colon townships and villages, will immediately extend its line to this place and install a system.

HANNIBAL, MO.—The Bluff City Telephone Company, which has begun the work of constructing a new telephone exchange in Hannibal in opposition to the Bell people, is to lay a submarine cable in the Mississippi River across to Illinois to connect with toll lines on that side of the river. Two thousand poles and about 27,000 feet of cable is also to be used by the company on its lines in the city.

ATKINSON, NEB.—An extension of the William Krotter Telephone Line is being run to this town, and a local exchange will be installed and also long-distance connections with all important towns. This line already covers Holt, Rock, Brown, Keya Paha and Boyd counties. The local exchange will start with upwards of seventy-five instruments on the line, and more will be added as fast as the company can do the work.

BINGHAMTON, N. Y.—The Home Company now has its line completed from Cortland to Lisle, and the stringing of the copper wire for the long-distance between Syracuse and Binghamton will occupy the balance of this month. It is expected that the putting in of a local exchange here will be begun about December 1st.

EAST FISHKILL, N. Y.—The East Fishkill Telephone Company is making arrangements to put up more wire and extend its lines. Several more subscribers have been secured and there is a bright prospect of quite extensive improvements next spring when the line will be extended to all towns and villages in this vicinity.

WATERVLIET, N. Y.—The Albany Home Telephone Company is constructing a system here. A franchise was granted it two years ago.

HENDERSONVILLE, N. C.—The Asheville company, now operating in Hendersonville with over 100 telephones, is to completely rebuild its plant. All necessary material and appliances have already been ordered. The present system is of the common return type, but when rebuilt will be full metallic, the same system employed by the company in Asheville. It is the purpose also to build additional lines to Flat Rock, to enable people in that vicinity to have telephone service. Superintendent Proctor says regarding the information to the effect that the Bell people were going to install a system in Hendersonville that he didn't think they would meet with sufficient encouragement to warrant the undertaking.

PORTSMOUTH, OHIO.—James Swearingin, representing the Portsmouth Telephone Company, has secured necessary rights of way and sufficient subscribers to insure a line from Portsmouth by way of Springville, Fullerton, Malonton, Argentum, Lynn and Warnock to Tygarts Valley. At Warnock it will be connected with the Greenup and Grayson line, forming a complete circuit.

CHESTER, PA.—The American Conduit Company, of San Francisco, Cal., has purchased a large plot of land here and will erect a factory for the manufacture of conduit.

NORRISTOWN, PA.—The United Telephone and Telegraph Company is at work upon an entire reconstruction of its telephone system in this borough. The plant is to be equipped with a central energy switchboard and instruments.

ROCKWOOD, PA.—The Somerset County Telephone Company will soon have lines connecting every important town in the county. A line is now being constructed from here to Confluence and intermediate points.

COLTON, S. D.—The managers of the local telephone system have decided to commence work at once on a twenty-mile extension of the system. The new lines will connect the residences of a large number of farmers with the local exchange. One branch will be built to Taopi and Hartman.

HONDO, TEX.—John and George Muennink, of New Fountain, and J. W. Crow and Dr. J. F. Beckmeyer, of Hondo, will soon construct a tele-

phone line from New Fountain to Hondo, where they will connect with the Yancy and Devine, as also with the new line being now built from San Antonio to Eagle Pass.

LLANO, TEX.—Two cars of poles, wire, etc., have arrived here and work will begin at once on the new telephone line for Llano. The new company is composed of Messrs. Schreiner & Compant, of Kerrville. They also own the local telephone service of Fredericksburg and Kerrville.

FAIRMOUNT, W. VA.—C. E. Manley, vice-president, and J. W. Barnes, manager of the Consolidated Telephone Company, were in Annettsville recently to make arrangements for improving the service. A connecting line will be run to the People's Telephone Line to Morgantown.

MISCELLANEOUS.

SOUTH BEND, IND.—The newly opened Independent telephone system here has about completed negotiations looking to a complete and ample toll line service in connection with the Citizens' Company, of Grand Rapids.

BOSTON, MASS.—The American Telephone and Telegraph Company's statement of the output of instruments for the month ended November 20 and fiscal year to date with comparisons follow:

Gross output.	93,487	88,497
Returned.	36,838	27,510
Net output.	56,649	60,987
From Dec. 2 to Nov. 20:		
Gross output.	994,422	867,323
Returned.	420,682	352,173
Net output.	573,740	515,150
Total outstanding, November 20.	3,099,346	2,467,966

HAMBURG, N. Y.—The Haines Telephone Company is closing a deal with the Frontier Company for making connections with Buffalo. As soon as the deal is closed, new instruments and switchboards will be installed. Connections are expected to be completed by January.

WARWICK, N. Y.—Representatives of six local Independent telephone companies met here recently to discuss matters of mutual interest and a basis for interchange of business.

HONESDALE, PA.—The Citizens' Telephone Company has made connections with the Northeastern Telephone Company and now reaches Clinton, Mt. Pleasant, Starrucca, Montrose and other points in Susquehanna county. The Citizens' Company also has connections with Beech Lake, Tanners Falls, Hawley, Ledgedale, Greentown and other points south. The company will soon have first-class connections with all points in the Lackawanna valley. The Independent companies are extending their lines everywhere.

MAHANOEY CITY, PA.—The town council has accepted the newly instituted fire alarm system erected by the United Telephone Company. The annual rental will be \$360 a year, the telephone company agreeing to keep the system in repair.

BOSQUEVILLE, TEX.—The Independent Telephone Company has a new branch line three miles north of this place.

FONDA, IA.—The Northern Telephone Company has just completed a copper metallic circuit from Fort Dodge to Humboldt, Gilmore City and Fonda, which, in connection with the Martin Telephone Company, gives the northern part of Iowa fine telephone connections.

MOUNDSVILLE, W. VA.—The National Telephone Company has about completed the work of installing its system here. A larger force of men than usual has been put on, so as to complete the lines before winter sets in. Mr. Barnett, superintendent of construction, states that all the cables in the city limits will be completed soon. The switchboard has arrived. The trunk lines to Wheeling will then be constructed and by the time the office fittings are in and completed, the town will have direct communication with Wheeling. The subscription list now reaches 130 and is gradually increasing. The company has made arrangements with the long-distance lines from the Federal Company, of Moundsville, and after putting the lines through a course of repairs, communication will be had with Waynesburg and other points in the state.

WEBSTER CITY, IA.—The E. H. Martin Telephone Company, of Webster City, has just completed a No. 10 copper metallic circuit of 45 poles to the mile, between Fort Dodge and Des Moines, Iowa, a distance of 105 miles, with only one intermediate station thereon, Webster City. This is the longest Independent copper metallic circuit west of Chicago.

PERSONAL

WELLSVILLE, N. Y.—H. A. Benedict, who has been the manager of the Wellsville telephone lines in this city, has been transferred to Elmira, where he has a more responsible position.

CLEVELAND, O.—H. D. Critchfield, general counsel of the Federal Telephone Company, has resigned, and W. L. Carey has been made general counsel of the Everett-Moore telephone properties. Mr. Critchfield has allied himself with the Automatic Telephone Company, of Chicago, which is putting in an Independent telephone plant in that city.

TRADE NOTES.

THE WARNER ELECTRIC COMPANY, Muncie, Ind., has found a ready sale for its pole changers. So successful have these instruments proven that there are numerous infringements of the Warner Company's patents, necessitating a notice by the company warning infringers.

THE CHICAGO PAY STATION COMPANY, Chicago, is greatly pleased with the outlook for its new modern coin collector. Demands for information regarding this type of apparatus and orders are greatly increasing in number and the outlook for next year's business is exceedingly bright.

THE EUREKA ELECTRIC COMPANY, Chicago, will have a fine exhibit in room 656, Auditorium Hotel, during Convention week. The latest products manufactured by this company will be shown by Messrs. L. J. Kusel, H. J. Kusel, D. L. Canmann, H. Rosenow, C. W. Robbins, Paul Gardner and others.

W. G. NAGEL ELECTRIC COMPANY, Toledo, Ohio, has its No. 5 bulletin ready for distribution to all those interested. This bulletin gives a full description of specialties which the company manufactures. The Nagel Company, however, does not confine itself to the manufacture of "Ready" specialties, as it also carries a complete line of telephone supplies.

THE CLARK AUTOMATIC SWITCHBOARD COMPANY, Providence, R. I., is doing a good business. Among its recent sales are a 36-point plant for the S. A. Woods Machine Company, Boston; a 36-point plant for the Atlas-Portland Cement Company, Hannibal, Mo., and also a 24-point plant, through its agent, Geveke & Co., Amsterdam, Holland, for the hospital at Groningen, and a 10-point plant for the D. & W. Fuse Company, Providence.

THE FISK-NEWHALL TELEPHONE MANUFACTURING COMPANY has just moved its offices to 166-172 South Clinton street, Chicago. This removal was made necessary by its rapidly growing trade. The company is rushed with orders and secures duplicate orders every day. The new factory is admirably equipped with the most modern machinery. The company is prepared to give prompt shipment of all orders.

THE CENTRAL MANUFACTURING COMPANY, Chattanooga, Tenn., is meeting with great success with its cross arms, pins, etc. It supplied much of this class of material for outside construction for the Louisville Home Telephone Company plant, conceded to be one of the best in the country. Many other Independent telephone plants have also given orders to the Central Company, and its business is rapidly increasing.

THE CENTRAL TELEPHONE AND ELECTRIC COMPANY, St. Louis, Mo., has just secured the services of Mr. H. J. Joys, a gentleman who has long been identified with telephone interests and who is now in charge of the company's Chicago office, 59 West Jackson Boulevard. The company is meeting with great success in its line of terminal heads and other protective devices. It will be represented at the Inter-State Convention with a very fine exhibit.

THE WILLIAMS-ABBOTT ELECTRIC COMPANY, Cleveland, Ohio, has recently remodelled its large and complete factory and reports a flourishing trade, both foreign and domestic. Its new "B" catalogue, giving special trade discounts, is ready for distribution. This catalogue explains fully its new central battery transmitter, the Sands farmers' telephone, and the latest express switchboard manufactured by the company. Copies will be mailed to those interested.

THE GORDON BATTERY COMPANY, New York, manufacturers of the well-known Gordon cell, strikingly illustrated in this issue, makes strong claims for the efficiency of its battery for telephone work—central energy switchboard transmitters, subscribers' stations, etc. Simplicity of construction, cleanliness, guaranteed long life and ease of charging are the dominant features of the battery. The company has a very neat little booklet illustrating the cells, which they are glad to send on request.

THE NEW HAVEN NOVELTY MACHINE COMPANY, New Haven, Conn., will have a good exhibit in room 662 at the Auditorium Hotel. It will have a full line of its novelty slidable straight sleeves, Y and three-way branches, pot and eight-way terminal heads, showing how telephone companies can dispense with the plumbers' wiped joint and do the work with their own men. The president of the company, Mr. H. Grant Thompson, will be on hand to demonstrate to telephone men the immense advantages of the company's Novelty goods.

MR. L. W. STANTON, who was superintendent of equipment for the Federal Telephone Co., of Cleveland, O., for years, and who resigned his position with that company a short time ago, has opened an office in the Electrical Building, Cleveland, as a consulting telephone engineer. There has always been a demand in the Independent industry for trained consulting engineers. Mr. Stanton's practical working experience with all classes of outside construction and the latest forms of central energy equipment specially qualify him for this new work.

JAS. S. BARRON & Co., New York, carry a high class line of insulator blocks, bridle rings and expanding sleeves. Their two-hole telegraph or rubber-hook insulator blocks are made of well seasoned wood and given two coats of paint. The H. P. corner bridle rings are made of enameled glass, the angle iron being galvanized. The insulated bridle or distributing rings and expanding sleeves can be used for wood or brick in or out of doors. A tity of diving apparatus with complete telephone attachments, both for the boat sent to those interested.

THE DE VEAU TELEPHONE MANUFACTURING COMPANY, New York, has just furnished the United States Government Navy Yard at Puget Sound, Washington, a complete central energy plant; also a complete telephone exchange equipment for Trinidad; a complete central energy plant for the Baiting Hollow Telephone Company, Baiting Hollow, L. I., New York, and many other companies and private firms throughout the country. It has just received an order from the United States Government for equipping a quantity of diving apparatus with complete telephone attachments, both for the attendant on the dock and the diver.

THE AMERICAN ELECTRIC TELEPHONE COMPANY has had a very successful period of business activity. It has just installed a complete 5,000-line common battery switchboard for the Interstate Telephone Company, at Trenton, N. J.; a toll board at Philadelphia for the Keystone Telephone Company, one of the largest of the kind ever built; a switchboard with a capacity of 2,500 lines at Texarkana. This latter board was put into operation sixty days after the order was received. Besides these, it is installing at Springfield, Mo., a 2,400-line switchboard, and also at Jackson, Tenn., and Paducah, Ky., switchboards comprising, respectively, two and three thousand lines capacity.

THE STANDARD VITRIFIED CONDUIT COMPANY, New York, has nearly completed its factories at South River, N. J., which will be among the largest of their kind in the world, and will be devoted entirely to the manufacture of multiple and single duct conduits. Both the Independent and Bell telephone companies recognize the Standard Company's conduits as being equal to all requirements, and large orders are being received. A new catalogue will soon be issued, which will serve as a very interesting and instructive book to corporations that contemplate underground work. Multiple duct conduit made by this company has a solid steel key connection, used only in the outer walls of the conduit, which is one of the best improvements in conduit construction made in recent years.

THE EMPIRE WIRE COMPANY, 100 William street, New York, was organized the early part of this year, taking over the business of C. M. Garrison, dealer in copper wire; the plant of the Empire Insulated Wire Company, manufacturers of silk and cotton covered magnet wire, and also the Spargo Wire Works Company, manufacturers of bare and tinned copper wire, with two factories at Rome, N. Y. Since that time the company has been greatly increasing its plant by the addition of new buildings and machinery. The combination has given it one of the most thoroughly equipped plants in the United States. Among its customers are the largest dealers and manufacturers in this country. All hard drawn telephone wire is guaranteed to be equal to the best manufactured.

PLANTS FOR SALE.

Advertisements under this head \$1.00 for 25 words or less for each insertion. Prepaid.

INVESTMENT OPPORTUNITY.—Telephone plant, 1 year old, 195 subscribers, 85 miles toll lines in booming town, 4,000; connections with Independent long-distance lines in view. Good reason for selling out. Address A, care of AMERICAN TELEPHONE JOURNAL, N. Y.

LEASE.—Wanted to lease telephone or electric light property, by practical, all around electrical man with some capital. Address CAPITAL, care AMERICAN TELEPHONE JOURNAL, New York.

WANTED.

Advertisements under this head, 25 cents for 25 words or less for each insertion. Prepaid.

WANTED.—Sober, reliable young man as superintendent of 200 subscriber plant and outside work. Must be thoroughly competent in switchboard and instrument work of magnet and common battery system; hustler, capable of maintaining plant to highest efficiency, and know how to get best work from employes. Address, stating experience, references and salary expected, TELEPHONE, Lock Box 93, Elizabeth City, N. C.

POSITION WANTED by strictly temperate man, 25 years old, with seven years' experience in Independent and Bell systems. Experienced in all branches of work. References from former and present employers. South preferred. Address EXPERIENCE, care AMERICAN TELEPHONE JOURNAL, New York.

MANUFACTURERS: An engineer, experienced in designing common battery apparatus, and with excellent references, desires position with a good telephone manufacturing company. Address ENGINEER, care AMERICAN TELEPHONE JOURNAL, New York.

EXCLUSIVE handling of an account, for Chicago trade, beginning January 1st. Manufacturers Agency basis. Address SALESMAN, care AMERICAN TELEPHONE JOURNAL, Monadnock Building, Chicago.

By H. P. CLAUSEN

coil signal, in which one of the coils is arranged for tripping an armature and displaying the signal, while the remaining coil is arranged for restoring the signal to its normal position, the fall of the shutter closing a normally open contact spring immediately under the target armature. Fig. 153 shows a simple mechanical view of a target signal, while 154 shows an accepted form in diagram, and 155 a variation in the winding.

For arresters there are several standard forms, Fig. 159 showing the familiar toothed plate lightning arrester, while Fig. 160 shows a more desirable diagram when a ground plate is to be shown, while Fig. 161 presents the well-known aerial or fuse protector. In Fig. 162 there is a combination of lightning and sneak-current arrester. Observe that the arrester consists of a lightning guard similar to Fig. 159 and a sneak current arrester composed of a flexible spring held in place by a fusible core, surrounded by a coil of wire. On the advent of a dangerously strong current the core fuses, the spring is released and the circuit opened. At the same time an auxiliary spring passes upward into contact with a normally open connecting pin and closes an electric bell, sounding an alarm. Thus this diagram represents a combination of lightning arrester, sneak current protector and an alarm circuit. Each of the elements may be used separately, though as a rule they should stand to-

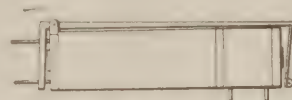


FIG. 150.



FIG. 151.

FIG. 152.



FIG. 153.



FIG. 154.



FIG. 155.

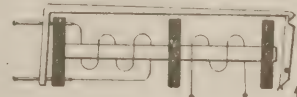


FIG. 156.

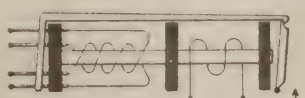


FIG. 157.



FIG. 158.

DROP SIGNALS AND TARGETS.

gether, as that is the manner in which they are assembled in practice. Fig. 163 shows a simple fuse wire, and as this diagram has been universally adopted, no other standard is necessary.

MEASURING INSTRUMENTS.

EDITOR'S NOTE.—The first article of this series appeared in the issue of Nov. 22. They will continue for many months.

as sufficient for the purpose. Fig. 164 is an easily drawn diagram and represents a galvanometer designated by the large G on the face. In Fig. 165 we have the same diagram but the presence of the V immediately identifies it as a voltmeter, while Fig. 166 containing a large A represents an ammeter. Referring to Fig. 167, while the W indicates that it is a wattmeter there is a double outside line, one heavy and the other a lighter line. Now observe that the voltmeter diagram was drawn by a light line and the ammeter by a heavy line, so the combination of a light and heavy line suggests amperes, times volts or watts.

SIGNALLING CURRENT GENERATORS.

Fig. 168 shows the well-known hand generator, this diagram

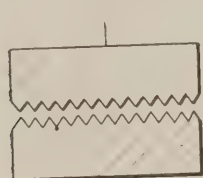


FIG. 159.

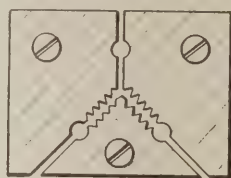


FIG. 160.

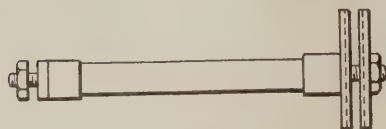


FIG. 161.

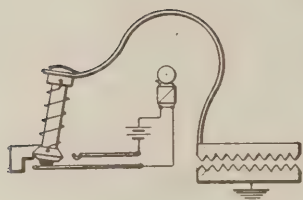


FIG. 162.

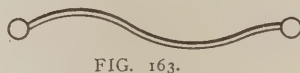


FIG. 163.



FIG. 164.



FIG. 165.



FIG. 166.

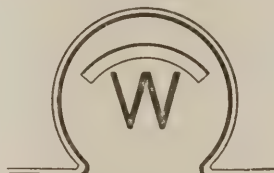


FIG. 167.

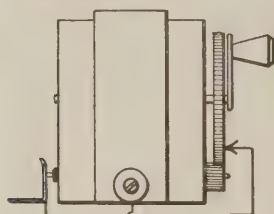


FIG. 168.



FIG. 169.

having seen much service while Fig. 169 is often found. Fig. 170 is used where it is necessary to show that inductive signalling current is provided. Fig. 171 shows a standard recommended for general work and is really a power generator. Fig. 172 is an easily drawn diagram and represents a signalling current generator driven by an electric motor, or a "motor-generator." In Fig. 173 a motor-generator is represented in which two currents are shown taken from collecting rings, as for pulsating current work. Fig. 174 showing this in a diagrammatic form, while Fig. 175, with the same combination as 174, contains the additional feature of a ground at the center of the winding, producing an alternating as well as a pulsating current. Fig. 176 indicates how current may be taken from lighting mains to charge storage batteries, etc. Fig. 172 may be used to designate a battery charging dynamo but as a rule, draughtsmen prefer to sketch in the approximate shape of certain machines with which they are familiar.

CONDENSERS.

The universally accepted form of condenser diagrams is Fig. 177, so only one is shown. Fig. 178, while it really represents the elements of a battery is sometimes, although improperly, used to mean capacity.

BATTERIES.

For batteries four diagrams are needed. Fig. 178 represents

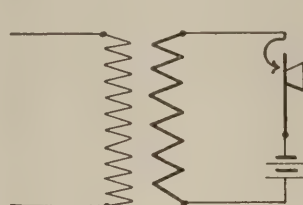


FIG. 170.

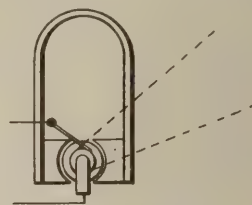


FIG. 171.

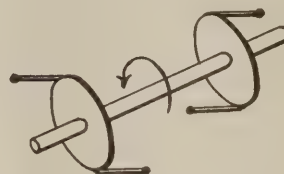


FIG. 172.

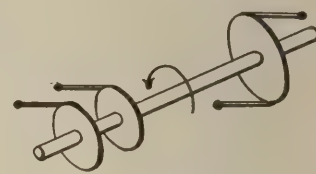


FIG. 173.

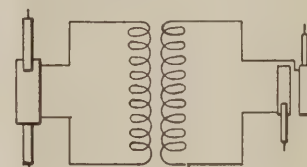


FIG. 174.

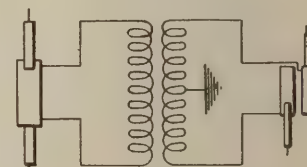


FIG. 175.

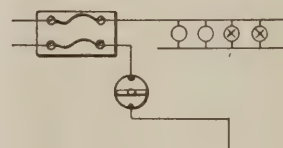


FIG. 176.

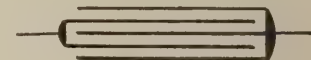


FIG. 177.



FIG. 178.

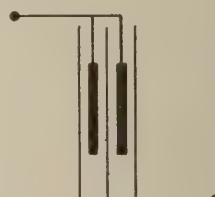


FIG. 179.

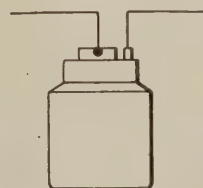


FIG. 180.



FIG. 181.



FIG. 182.



FIG. 183.

any kind of a battery; Fig. 179 may be used to indicate a storage battery; Fig. 180 an open circuit battery and Fig. 181 a series of batteries whether of open or closed circuit.

CONNECTIONS.

Fig. 182 is the well-known ground connection and it is the only form of ground connection used. Wherever two wires cross each other, one of the lines is shown to lap over the line running at right angles to itself. This is an easily understood method and one which will be followed.

SOME STEPS IN THE EVOLUTION OF SWITCHBOARD CIRCUITS

ARTICLE III.—THE SERIES GROUNDED TRUNK CIRCUIT

By J. C. KELSEY

THE advent of the trolley sounded the death knell of grounded circuit systems, though it was long before metallic service became general, and even now some grounded service is maintained, owing to rate distinctions. Whenever a subscriber concludes to pay the metallic service rate, the telephone company kindly puts a thin sheet of mica between the carbon arrestors, and lo! the subscriber is enjoying the privileges of metallic service. But before the advent of metallic switchboards, the con-

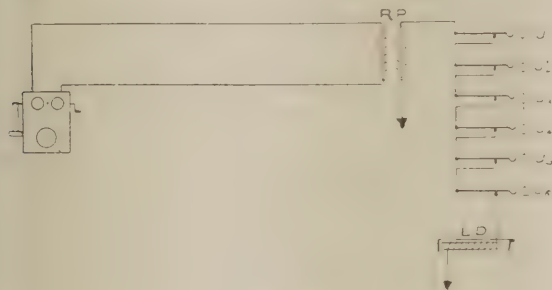


FIG. 12.

nection of a metallic line to a grounded one without destroying the benefit of the metallic line presented a formidable problem. Time was when grounded subscribers could not get long-distance service, because there was no way of connecting lines, without utterly unbalancing the quiet toll line, and making it too noisy for use.

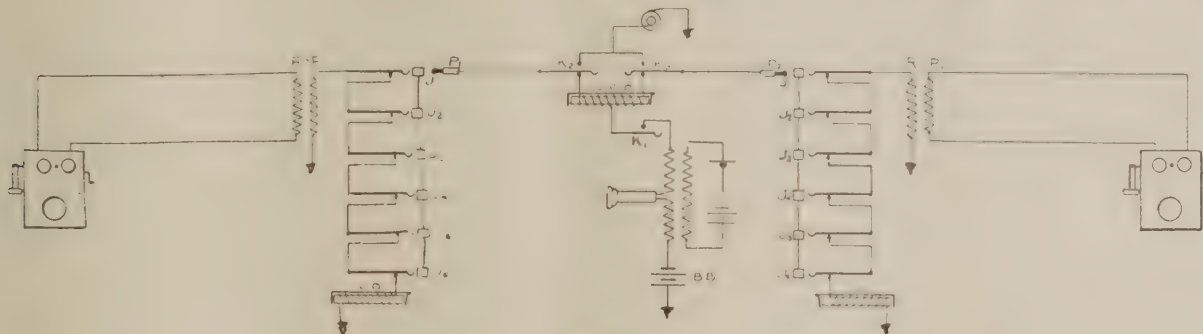


FIG. 13.

With a repeating coil, the proposition of connecting grounded and metallic lines became an easy one. In Fig. 12, R P is the repeating coil, and is inserted in the line, so that the exchange and the metallic line are in inductive relation only. The windings measure about 150 ohms on one side and 300 ohms on the other, a ratio of 2 to 1. A single turn of the magneto handle gives an impulse to the primary winding, and according to the laws of self and mutual induction, an impulse is generated in the secondary winding, of nearly equal strength, only in an opposite direction. This impulse excites the line drop L D and the shutter falls nearly as readily as though the line were purely metallic. As for cutting down transmission, an idea of the percentage of loss per coil may be gleaned from the fact that conversation may be carried on through twenty of them. From this it would appear that one coil would cut down transmission about five per cent.

The subscriber's line is free from earth current troubles and is quiet. But he loses five per cent. of volume when he connects with central, and ten per cent. when connected to another metallic party. If he calls a metallic party in a branch exchange, he will lose another ten per cent, owing to the presence of two repeating coils in the trunk circuit. But it may be presumed that even with this loss, the service is preferable on account of freedom from noise. But it must not be imagined that repeating coils are always detrimental to transmission, because there are cases where they are a decided advantage. Where lines have a great capacity,

owing to long cables, a repeating coil at the central office, even on metallic lines, will give decided aid to transmission, owing to the well-known fact that the impedance of the induction coil winding will counteract the effects of the capacity.

Fig. 13 shows two metallic parties in connection through the grounded exchange. R P is the coil in calling circuit and R¹ P¹ is the coil of the called circuit, with P¹ and P² the plugs K¹, K² and K³ the keys of the cord circuit, including the operating set, and the busy battery B B.

Omitting the details of the cord circuit, Fig. 14 serves to show the two transformations, or the quiet connection of two lines, under conditions of a grounded cord connection.

As business grew in certain districts far from the central offices, considerations of economy led to the establishment of branch exchanges, and trunk lines were used to handle business between exchanges.

Owing to light traffic, the trunk lines were treated as regular exchange lines, and when a party was desired in another exchange, the operator would test the trunk jacks and finding one that was not busy, would ring on it as on a regular subscriber's line. The operator in the other exchange seeing the drop fall would answer the call just as she would a regular subscriber. This system would not do for a busy exchange, owing to failure to get the trunk disconnected at both ends simultaneously. The operator at one exchange would test all right, but she had no guarantee that the last called party on that trunk had been disconnected, and instead of getting the other exchange operator she would ring the last subscriber.

In trunk work, one operator must be responsible for the entire

connection and this means a signal so that when the originating operator pulls out her plug, notice is given to the operator who answered the trunk to pull down her connections, thereby leaving the trunk entirely clear.

Fig. 15 shows the original trunk, grounded at both ends, and terminating in drops. But the prevalent earth currents compelled the company to make the trunks of a metallic nature, which is shown in Fig. 16. However, this made no improvement in operating conditions, and a radical change was made. The middle

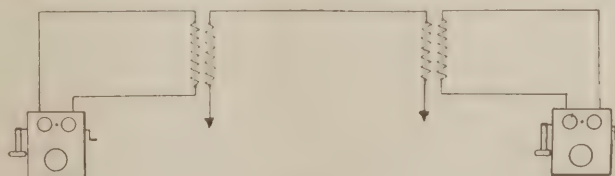


FIG. 14.

points of the line sides of the repeating coils were connected at the originating end to a pair of jack springs, so attached to the main jack spring that the entrance of a plug closed the contacts, as in Fig. 17. One of these springs was attached to a battery, C, and thence to the earth. At the B exchange end the middle point of the line side was connected to a magnetic signal M S.

The trunks were used one way only. A call for the B exchange would be rung down as before, and the act of inserting the plug

also energizes the magnetic signal and tells the answering trunk operator that the plug has been left in the jack at the other end. B answers as usual, by inserting her answering plug and throwing her listening key forward and asking the calling subscriber "Number please?" The advantage of this circuit becomes apparent when the parties are through talking. The A operator, being responsible for the connection, supervises it, and receiving the

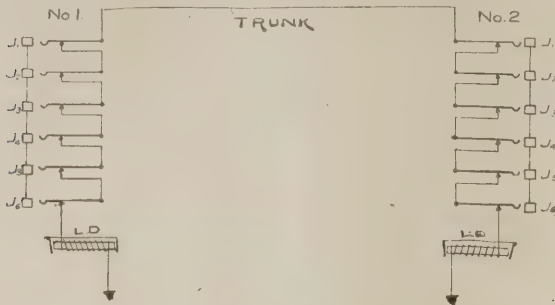


FIG. 15.

disconnect signal from the subscriber, pulls out the plugs, which notifies the trunk operator, who pulls down her connection without listening in. This is a great improvement, and partially does away with the confusion of ringing back when a new trunk call is made. But several objections remained. First, it was slow. Second, the operator beside wasting some valuable time testing for a trunk not busy, also gave each pair of subscribers talking on a busy trunk a vicious click. If she found ten trunks busy, she

plug. According to operating rules, the B operator must not pull down a connection, however well she knows the parties have ceased to talk, so the clearing-out drop was renewed, so that when parties happen to ring off, the A operator gets the signal, verifies the fact and pulls out her plug, which gives B orders to pull down her plug.

Fig. 18 shows the complete trunk circuit, K^3 as the ringing key, K^2 the listening key, and K^1 is omitted. The clearing-out drop C O D is gone. The trunk jack and drop are also missing,

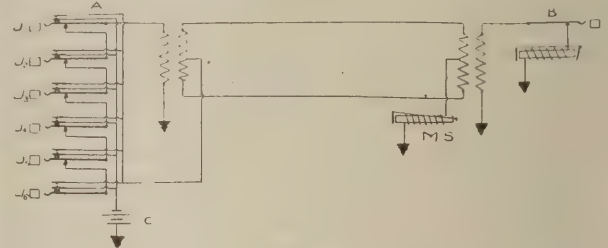


FIG. 17.

because trunk orders are made verbally and trunk disconnection orders are made mechanically.

Fig. 19 shows the order wire keys and connections and the trunk from one exchange to another, besides the entire cord connections from Main 50 to Branch 25. No. 50 calls, and A answers with P^1 . She presses cam of K^1 and ascertains number. Finding this, she presses K^4 and says to B, "Number 25." Whereupon B says: "On two," meaning trunk No. 2. A inserts P^2

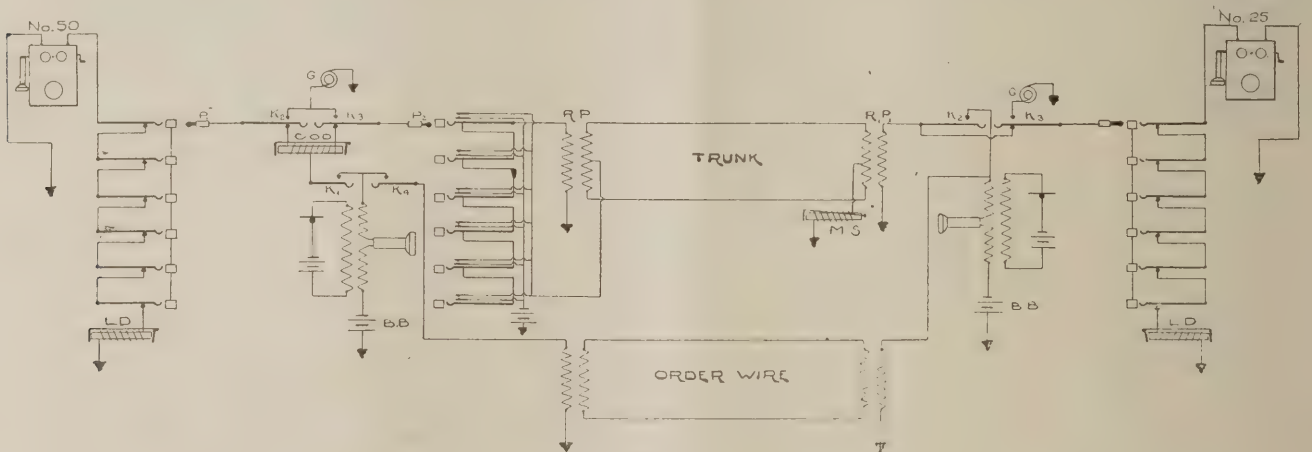


FIG. 19.

would give twenty parties talking the busy test. To improve on this, the order wire was evolved, extending from the order keys of all the A operators to the B or trunk operator in the other exchange. Instead of testing for a trunk, the operator presses her order key, which connects her talking set with the B operator in the other exchange and tells B that she wants a party in her exchange. B, having all the trunk jacks in front of her, can instantly name a trunk which is not busy. When A inserts the calling plug in the appointed jack, B is assured of the correct

into jack of No. 2 trunk. B sees the magnetic signal, M S, actuated, and knows she is safe in ringing No. 25; that is, if it has not tested busy. If found busy, she presses cam K^2 and tells the calling subscriber directly that the trunk is busy. B hears him hang up but she cannot cause A to pull down her connection. If the line No. 25 is not busy, B plugs in and presses cam K^3 and rings the bell. If No. 25 rings off, B will not know it, for she has no clearing-out signal but A will get this information and

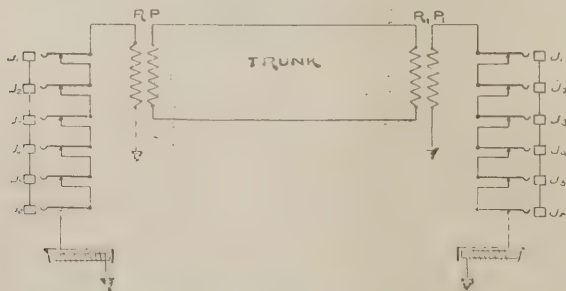


FIG. 16.

understanding of the A operator, and rings the party desired, knowing that the connection will be properly made. But some improvements are necessary for the B operator: There is no use of having a double ringing key, because B never rings back on the trunk, and there is no use of the extra work of plugging into the trunk jack each time, so the trunks were made to end in a

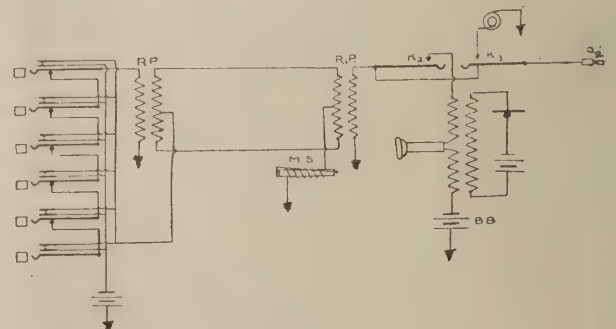


FIG. 18.

pull out plug P^2 , which de-energizes the disconnect signal M S. B now pulls out her plug P^2 , and the trunk is ready for another call. Later it will be shown that B has neither ringing nor listening keys, but receives verbal orders to connect and automatic or mechanical orders to disconnect; in fact, the modern B operator never speaks to a subscriber under any circumstances.

INTER-STATE TELEPHONE ASSOCIATION MEETING

AT Chicago in the Auditorium Hotel, Tuesday, Wednesday and Thursday of this week, the second Convention of the Inter-State Telephone Association was held. This event has been looked forward to by everyone interested in Independent telephony in this country. The meeting was the most successful in the history of telephone conventions. The attendance was enormous. An idea of the number present can be obtained from the fact that there were present at the banquet tendered by the manufacturers and supply dealers over five hundred guests.

Tuesday afternoon the following papers were presented:—

"Rates—Measured Service," by George N. Bandy; "Sliding Scale Rates for Exchanges," by Dr. H. S. Herr; "Toll Rates," by H. H. Robinson. The following papers on "Restrictions by Municipal Authority, and Synopsis of the Law," followed by discussion, were read and took the remainder of the afternoon: Ohio, W. F. Laubach; Iowa, U. S. Alderman; Wisconsin, J. C. Harper; Minnesota, E. E. Webster; Michigan, J. B. Ware; In-

diana, E. W. Pickhardt; Illinois, M. Savage; Missouri, H. Linton Reeber; Kentucky, D. L. Pendleton.

Thursday morning from 9 to 12, the following papers were read: "Settlement of Toll Business between Connecting Companies," by A. L. Hutchinson; "Enforcement of Message Time Limit," by H. E. Ralston; "Independent Telephone Securities as an Investment—From a Banker's Standpoint," by J. D. Powers; and "From a Small Investor's Standpoint," by J. W. Layne; "The Berliner Patent, Bell's Claims of Infringement and Litigation now Pending," by J. J. Nate; "Suggested Methods for Improving Long Distance Telephony," by C. E. Hull.

At the business meeting of the Convention the following officers were elected for the ensuing year: C. E. Hull, Salem, Ill., president; L. A. Frazee, Connorsville, Ind., vice-president; E. M. Coleman, Louisville, Ky., secretary; J. W. Layne, Carthage, Mo., treasurer. Executive committee: H. S. Herr, Ottumwa, Ia.; W. Guy Jones, Columbus, O.; A. L. Hutchinson, Weyauwega, Wis.; E. H. Moulton, Minneapolis, Minn.; O. Rex, Connorsville, Ind.; A. B. Conklin, Joilet, Ill.; W. F. Hall, Clinton, Mo.; David Pruett, Winchester, Ky.

TELEPHONE EXCHANGE ENGINEERING

ARTICLE III.—SPECIFICATIONS FOR A CENTRAL OFFICE EXCHANGE EQUIPMENT

By RAY H. MANSON, ALBION D. T. LIBBY and CHARLES H. SIMPSON

SWITCHBOARD EQUIPMENT.—The distribution of apparatus and circuits in the switchboard sections shall be as follows:

First Section.—The first section is to be a combined night toll and incoming trunk ("B" board) section, and shall be equipped with eighteen hundred subscribers' multiple line jacks.

The first position shall be arranged for night toll service, and shall contain, besides its full complement of multiple line jacks, twenty toll line drops and jacks, seven toll to local and three toll to toll cord circuits, and a complete operator's equipment.

The second position shall be arranged for incoming trunk service, and shall contain, besides its full complement of multiple line jacks, twenty incoming trunk lines, terminating in plugs, located in the plug shelf, a pilot call circuit, a "busy back" jack, a "don't answer" jack, a strip of five order wire push-buttons, and a complete operator's equipment.

The third position shall also be arranged for incoming trunk service, and shall contain, besides its full complement of multiple jacks, the same apparatus and circuits as the second position of the first section.

Second Section.—The second section is to be a combined incoming trunk ("B" board) and subscriber's ("A" board) section. It shall be equipped with eighteen hundred multiple line jacks.

The first position of this section is to be arranged for incoming trunk service, and shall at present contain no other apparatus besides its full complement of multiple line jacks, and twenty outgoing trunk jacks. It shall, however, be drilled and arranged for an equipment similar to that of the second position of the first section. The outgoing trunk jacks shall be so placed as to correspond to the position of, and be wired in multiple with, the outgoing trunk jacks in the first position of the third section. These trunk jacks are for use of the first subscriber's or "A" board operator.

The second position of this section is to be the first position or beginning of the subscriber's or "A" board. It shall contain, besides its full complement of multiple line jacks, an equipment of forty multiple outgoing trunk jacks; one hundred answering jacks and associated lamp signals, a pilot call circuit, a pilot supervisory circuit, fifteen complete cord circuits, a strip of ten order wire push-buttons, a complete operator's outfit, and two two-way toll trunk circuits to the toll board, terminating in plugs and associated lamp supervisorys.

The third position of this section shall have an equipment similar to the second position of the same, omitting, however, the multiple outgoing trunk jacks, and the two-way toll trunk circuits.

EDITOR'S NOTE.—The first of these articles appeared Nov. 22. Others will follow in nearly every issue.

Third Section.—The third section is to be a subscriber's or "A" board section, and shall be equipped with eighteen hundred multiple line jacks.

The first position of this section shall contain, besides its full complement of multiple line jacks, an equipment of twenty multiple outgoing trunk jacks, one hundred answering jacks and associated lamp signals, a pilot call circuit, a pilot supervisory circuit, fifteen complete cord circuits, a strip of ten order wire push-buttons, a complete operator's outfit, and two two-way toll trunk circuits, terminating in plugs and associated lamp supervisorys.

The second position of this section shall have an equipment similar to that of the second position of the second section, omitting, however, the two-way toll trunk circuits.

The third position of this section shall have an equipment similar to that of the third position of the second section, with the addition, however, of two two-way toll trunk circuits.

Fourth Section.—The fourth section is to be a subscriber's or "A" board section, and shall be equipped with eighteen hundred multiple line jacks.

The first position of this section shall have an equipment similar to that of the first position of the third section, omitting however, the two-way toll trunks.

The second and third positions of this section shall have an equipment similar to that of the second and third positions, respectively of the second section.

Fifth Section.—The fifth section shall have an equipment similar to that of the third section.

Sixth Section.—The sixth section shall have an equipment similar to that of the fourth section.

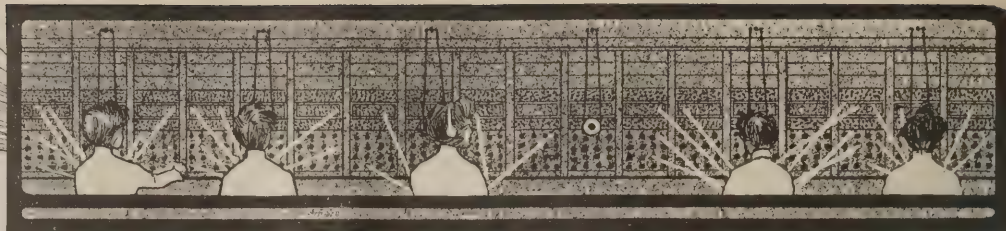
Seventh Section.—The seventh section shall have an equipment similar to that of the third section.

Eighth Section.—The eighth section is to be a subscriber's or "A" board section, but at present is to be only partially equipped. It is to have the first four panels equipped with twelve hundred multiple line jacks, the remaining two panels being left blank.

The first position of this section shall have an equipment similar to that of the first position of the third section, omitting, however, the two-way toll trunks.

The second position of this section shall be drilled and arranged for an equipment similar to that of the second position of the second section, but shall at present have no equipment, excepting that the lines from the Chief Operator's and Wire Chief's desk, which terminate in plugs, shall be brought out at the key-board of this position.

The third position of this section shall be drilled, and arranged for an equipment similar to that of the third position of the second section, but shall have no equipment at present.



The Operating Field

MT. VERNON TELEPHONE COMPANY

ON January 18, 1900, the Mount Vernon Telephone Company, of Mt. Vernon, Ia., was organized. At a meeting of the directors James E. Harlan was elected president; E. B. Willix, vice-president; T. A. Gormley, secretary; J. B. Albrook, treasurer; H. M. Kelley, general manager.

The paid-up capital stock of the company is \$10,000, divided into \$100 shares. The system began with 65 subscribers. Since that time the number has increased to 218. Of the 218 telephones now in use, 3 per cent. are in farm residences. Three makes of telephones are used, the Williams Abbott, Eureka and the Stromberg-Carlson. The office is equipped with the Eureka switchboard and has an immediate capacity of 220 lines. Individual metallic circuits and party lines are used. The rates are \$12 annually for residences and \$24 for business houses.

Since its organization the company has experienced two severe losses by fire and lightning. But it is now rapidly gaining strength and promises to pay dividends to stockholders in the near future.

The company owns its own plant, a neat one-story brick building, well ventilated, lighted by both gas and electricity.

ALL WANT INDEPENDENT CONNECTIONS

THE troubles between the various telephone companies doing business in this county has broken out again, and from all indications there is a warm time ahead, says a special Fremont dispatch to the Omaha, Neb. *Bee*. The patrons of the Farmers' Company in the eastern part of the county object to the traffic arrangement with the Bell Company and threaten to withdraw from the company. The Independent Company of this city and the Hooper Company, which have a joint traffic arrangement, hope to get a number of the Farmers' Company on their list. Some parties here who bought stock in the Farmers' Company claim that they did so relying on an agreement that a traffic arrangement would be made with the Independent Company as soon as it was organized and are threatening to bring suits for the amounts they paid.

DESTROYS COMPETITION

THE Bell Telephone Company notified its subscribers at Belpre, O., and Parkersburg, W. Va., recently that the rates would be advanced after November 1 to sums nearly double the old rates. The result is that out of 30 Bell telephones in Belpre there are only 7 left, and these will be ordered removed as soon as the West Virginia Western Company, of Parkersburg, installs its cable across the river and connects the Belpre with the Parkersburg exchange. The West Virginia Western and Home companies now have forty subscribers in Belpre, and the Belpre exchange is giving good service to the Belpre, Rockland, Porterfield, Little Hocking and Coolville patrons.

As soon as the river cable is in place Belpre will again have service with Parkersburg and Marietta. The Bell company will not have a subscriber in Belpre.

INDEPENDENT COMPANIES CONSOLIDATED

THE Interurban Telephone Exchange Company, of Holmes City, Minn., has purchased the Park Region Telephone Company. It has increased its capital stock from \$10,000 to \$100,000, and has been reincorporated.

The company was first organized by a number of Holmes City people of whom the Rev. Rudolph Vallquist was the leading spirit, two of the others being the Hon. H. L. Lewis and Mr. P. J. Christopher. As first organized, it had its business head at Holmes City and its first effort was to build a line from Kensington to Alexandria, taking in Holmes City and the farmers around. After long negotiations to get connection in Alexandria it finally this fall got its line completed from Kensington to Alexandria, and service over that line was commenced. The great difficulty in getting this connection was the contract the Park Region Company, of Alexandria, had with the long distance company, which prohibited them making connection with any other line.

In the meantime, however, the Interurban had completed a line from Holmes City through Moe to Brandon, and thence up through that town and Evansville town to Evansville village.

Many of the leading business men of Alexandria, Kensington, Brandon and Evansville were taken into the new company and the Park Region Company was finally bought out and the Interurban Company assumed business control of both companies November 1, and the business is now carried on under the name of the Interurban Telephone Exchange Company. Under the amended articles of incorporation it is one of the strongest corporations in Northern Minnesota, and under the present management it will have one of the most complete and perfect telephone exchange systems in Minnesota. Its equipment will be modern and up to date in every way. Its lines now extend to Alexandria, Parkers Prairie, Millerville, Leaf Valley, Carlos, Holmes City, Kensington, Moe, Brandon, Evansville, Hoffman, Farwell and Lowry. These lines will be put in better working condition and looked after more closely. The company is now putting in an exchange at Evansville, and will follow this up with other exchanges where necessary as soon as possible. Toll stations will be put in each town and the service already given, made still more perfect.

If the poles and material can be had this fall and the weather holds good, the company proposes to run several new lines. One line will be put in from Alexandria to Nelson, and eventually from there through Crooked Lake to Belle River. The line from Alexandria into Carlos will be extended from the Kohlhaas station.

One other line is badly needed, and if the company can get the necessary encouragement, should be put in another season. That is a line from Alexandria through Hudson to Glenwood.

The company has recently purchased property, and will next year build a fine brick building. The building will have a full basement, the first floor will probably be fitted up as offices. The second floor will be fitted up for the exchange and for offices for the company.

The present officers of the company are: President, H. T. Holverson; vice-president, Thos. Brusegaard; secretary and general manager, Rudolph Vallquist; treasurer, Tollef Jacobson.

Its rates for service are as follows: For farmer service: \$12.00 per year for connection outside of Alexandria local; \$15.00 per year for connection to all the villages and lines in the county. Extra cost for installation: \$5.00 for installation of instrument when subscriber resides inside of 40 rods from where a line is running; \$10.00 for distance of over 40 but less than 80 rods. For distances over 80 rods, 1 share of common stock at \$25.00 must be paid for each half mile.

THE OPERATING FIELD

For villages, except Alexandria: Residence telephones—\$12.00 per year for local connection; \$15.00 per year for division connection; \$18.00 per year for county connection, including Alexandria local.

Rates for professional and business men: \$24.00 per year for local connection; \$30.00 per year for division connection; \$36.00 per year for county connection.

For Alexandria Village: \$12.00 per year for residences; \$24.00 per year for professional and business men. \$12.00 per year extra if connection is wanted with county system.

Combination rate: \$48.00 per year for 1 business and 1 residence telephone, both having connection with county system. Extension telephones 25 cents per month.

EASTERN DEVELOPMENT AND PROGRESS

THE Frontier Telephone Company, of Buffalo, is rapidly completing its plant in that city. Just as soon as it is ready to start business the United States Telephone Company's long distance lines will be extended from Erie, Pa., to Buffalo, where connection will be made with the other Independent toll lines of New York State.

The Independent telephone situation in New York State is rapidly being straightened out. Two companies are building long distance service there in different parts of the State. One of them is the Independent Union Telephone Company, which is owned by the Rawson Syndicate, of Elyria, O. This company connects Schenectady, Niagara Falls, Tonawanda, Cohoes, Lockport, Medina, Warsaw, Albany, and many other towns. The Inter-Ocean company, which is owned by the Consolidated company, is also building in New York State. Considerable controversy has arisen between these two latter companies, as to which syndicate will secure exclusive connection with the United States Telephone Company. The United States Telephone Company is ready to do business with either or both of them.

WHAT A WOMAN THINKS OF THE TELEPHONE

A WOMAN reporter in Little Rock, Ark., has been making some investigations of telephones and telephone exchanges. Her conclusion is that it does no good to "jerk the receiver" when one doesn't get a number wanted. Here is some of what she has to say:

"What number, please?" says the low, sweet voice of the telephone girl.

"For goodness' sake, central! What on earth is the matter with you? I have worked the receiver nearly off trying to make you answer. I know the 'phone is not out of order. If I can't get better service than this for my money I shall report you to your manager and have the other company's 'phone put in. It is unbearable, outrageous! Now, see if you can give me seven, one, five—seven fifteen—will you?" He snaps out the last words like the expiring effort of a bunch of firecrackers; 715 doesn't answer. The receiver is jerked up and down again.

A moment later he hears the same sweet, low voice: "What number, please?"

"Seven fifteen!" he fairly yells. "Didn't I tell you that before? What's the matter with your ears?"

"Seven fifteen. Don't jerk your receiver," says the sweet voice, unchanged despite the tirade of the subscriber.

Hardly a business man but who has gone through a conversation something like the above. And why? All because of a fond delusion on the part of the subscribers of the telephone company that it makes central answer quicker to bob the receiver hook up and down. "It hurts my ears," you hear them say with a note of satisfaction and triumph.

But it doesn't.

The popular fallacy has gained credence everywhere that central must answer a call the quicker out of sheer desperation.

But she doesn't.

Central is essentially a busy woman. Seated on her little throne of polished oak, she reigns with supreme queenliness over scores of queer-looking little flexible rods or wires, with long brass tips.

They are her subjects. She rules them, not with a rod of iron, but with marvelously deft and knowing fingers.

Before her is a polished oak board, from which protrude at short and regular intervals about one-sixteenth of an inch of tiny electric bulbs. At the back of the table-like affair, much like the mirror portion of a bureau, are innumerable little holes, each one representing a subscriber, into which, when two telephones are connected, fit the brass tips of the flexible wires. When the conversation is over and both persons hang up their receivers, the wire is pulled out and drops back into its place by its own weight until only the brass tip may be seen.

The tiny incandescent bulbs are the signal that some one wants to make a call. The taking down of the receiver forms a short circuit which sends a current through the bulb and lights it with a glow-worm brightness.

At the same time what is called a section light is turned on among the little holes. This informs the hello girls in what section is the caller's telephone. She could find it, but the section light saves time and trouble. That is the whole object of good service on the part of the telephone company to save themselves and the subscriber time.

Each of the little bulbs has a mate, which, when the connection has been made, burns brightly until both receivers are hung up. The light subsides to a mellow glow, when central knows that the conversation is over and she may drop the wire back into its place.

As to bobbing of the receiver, wise little central always takes her cue when she sees a light dancing. She knows that there is an anxious subscriber at the other end, but she is unable to remedy matters until the light burns steady. If she stops answering dozens of other calls, which are coming in all the time, to pacify the one irascible caller, she will have as many others of the same kind on her hands. Consequently, when the light begins to flash and go out as the long and short circuits are alternately made, she keeps a watchful eye on the bobbing light, but continues to answer the other calls, until the subscriber, from exhaustion more than anything else, comes to a lull.

Then follows the welcome "What number, please?" and more often than not, the tirade against central because she hasn't answered before. The abuse of the company and the hello girl is an obvious injustice, yet it has taken nearly all telephone subscribers a long time to find it out.

FINANCING KANSAS CITY HOME COMPANY

A PLAN has been adopted for financing the Home Telephone Company of Kansas City, Mo. This will provide for an authorized capital stock of \$3,000,000. The Germania Trust Company, of St. Louis, will underwrite the securities. Twenty-year five per cent gold bonds will be issued to provide \$1,700,000. The plant, when completed, will represent an outlay of \$2,000,000. The officers of the Home Company are Joseph J. Heim, of the Heim Brewing Company of Kansas City, president; Henry Koehler, Jr., president of the Germania Trust Company, first vice-president; E. L. Barber, president of the Central Construction Company, of Toledo, Ohio, second vice-president, and O. C. Snider, of Kansas City, secretary.

Mr. Barber, Mr. Heim and Mr. Koehler will largely be entrusted with the management of the affairs of the company.

Hugh C. Ward, attorney for the Home Company, announces that of the total capital \$500,000 has been subscribed in Kansas City, \$1,500,000 in St. Louis, and the balance in other cities.

The public of Kansas City is very favorably inclined to the Home Company, and this plan for its financing is the last thing needed to give assurance that the company is in Kansas City to stay, to construct a system and operate it absolutely independent of, and in competition with, the Bell Company. Everything now points to the early completion of the system. A number of underground conduits have already been laid, and construction work is being pushed. The company is much commended for the scope of its underground system, which will far outlive the Bell conduit system. Contracts have already been awarded for poles, wires and other supplies, and as soon as these are delivered this work will be taken up, and rushed to completion.

Opinion and Comment

TELEPHONE COMPETITION

IT is often urged, generally by those who speak from an interested motive, that the business of conducting an exchange telephone system is a "natural monopoly," that there should not be more than one telephone exchange system in any one town. Broadly speaking, it is true that the convenience of the general public would be best served by having only one telephone service in a town—always provided that that service were thoroughly efficient, supplied at a reasonable rate and actively developed so as to make it of the greatest possible value to the user. Whether the telephone service is a "natural" monopoly or not, it is certain that for many years it has been an actual monopoly in almost every country in the world, and it is equally certain that in very few cities has the telephone service been thoroughly efficient, supplied at a reasonable rate or actively developed in the direction of spreading the facilities over as wide a field as possible.

Wherever there is a chance of making a profit, competition, that great regulator of commerce, will not hesitate to step in and give battle for the opportunity of securing that profit. It is plain to many that the telephone business is capable of yielding great profits, and it is also plain that opportunities have been largely neglected and valuable fields left uncultivated by those in whom the absolute monopoly of the business was so long vested. Therefore the talk of "natural monopoly" will not deter and should not deter those who think they can give a better, cheaper and wider service than the established concern, from making the attempt. Competition in telephony has many more complex problems to deal with than competition in ordinary industries, but in the long run it will succeed or fail according to the laws that govern competition in ordinary business—he who gives the best article for the least money will succeed in the end.

That there are unlimited opportunities for telephone competition is apparent to anyone who for a moment considers the wide variation in the development that the telephone service has hitherto attained in different places. In some places, but very few, there are telephones in the proportion of eight or ten to every hundred inhabitants, but in most large towns the proportion of telephones to inhabitants is more like one or two to the hundred, and in many it is even less. Those figures mean that in a few places the telephone business has been well done, that the service is good, the rates reasonable and the management active; but that in the large majority of places, for the development that has been attained in one place is quite attainable

in another, the service has been poor, the rates high and the management blind both to its responsibilities and to its opportunities. In the first class of town there is obviously not much incentive to start a competitive system, but in the second the field is open, uncultivated and inviting.

Therefore, wherever there has been a telephone service which has been both bad and dear, and consequently has not been developed so as to be useful to a large section of the community, the public, far from listening to talk of the telephone service being a natural monopoly, should welcome competition. The telephone is bound to come into almost universal use. Its conveniences are so great, it is such an effective labor-saver and time-saver and coadjutor in all affairs of life, that every active town needs a telephone service developed to the utmost possible limit. Ideas as to the utmost possible development of the telephone service have broadened greatly in the last few years, and a development of twenty per cent.—one telephone to every five inhabitants—is by some not considered too high a mark. Now the management which will give to any city a telephonic development such as this is not the management which is content to potter along charging high rates for an indifferent service, but the management which has a high standard of service, a low standard of rates and the general determination to push and develop the business for all it is worth.

Competition from quarters inspired by these principles is the kind of telephone competition that is arising, and is doing so much to increase the usefulness of the telephone. For a time public inconvenience may be felt from the existence of two competing telephone systems in the same place, but this cannot exist for long, because one will eventually outdistance the other and the smaller system cannot long endure. The public will eventually be the gainer, as it will have a better, a cheaper and a more widely developed telephone service than it had before or was likely to have without competition. On a small scale this result of telephone competition has been illustrated at Tunbridge Wells, in England, whose telephone affairs have lately occupied much space in the English technical papers. In the days of monopoly Tunbridge Wells had 110 subscribers at the minimum rate of \$40. Now, after two years of competition, the amalgamated system has 1,688 subscribers at a maximum rate of \$30, with other lower rates to choose from. Telephone competition is justified by opportunities neglected and a business misunderstood and not appreciated by the first comers. In the years to come every town will probably have its single homogenous system, but in the meantime there is ample scope for much valuable work.

FOREIGN CURRENTS

THE sale of the Tunbridge Wells municipal telephone system to the National Telephone Company is the one telephonic subject of interest in the English electrical journals just now. There are various conflicting opinions, as is only natural when one considers that some journals are strenuous opponents of municipal trading, while others are equally enthusiastic advocates of municipal control of public services. In the present instance there is some talk of "conspiracy" and dark hints as to the manner in which the negotiations between the National Telephone Company and the corporation officials, have been carried out. The proposed sale of the municipal telephone system has met with much opposition from the rate payers of Tunbridge Wells, and there have been indignation meetings and resolutions of protest in alarming number. In fact, the whole affair seems to have developed into one of those bitter telephonic fights with which the history of the telephone industry is by no means unfamiliar.

* * *

The points that are really of interest to us on this side of the water, however, are the results that have actually been achieved by the competition, as far as it has gone, in the development of the use of the telephone. The Tunbridge Wells corporation seems to have become thus early discouraged in its telephonic fight—the system has been working only for some eighteen months—by reason mainly of the much larger expenditure of capital which it has been called upon to make than was forecast in the original estimates. The original estimate was for \$50,000, which was to provide a complete system sufficient for the needs of the town. A short time ago \$75,000 more was raised and this total of \$125,000 was to furnish a system with some 1,100 working lines. Practically the whole sum has been spent and more money is now needed, while the actual working lines amount only to some 850. Some of the work has cost more than was estimated and apparently some necessary work was omitted from the estimates altogether. A further source of discouragement has been that under the very cheap message rates offered, \$12.50 a year and two cents a call, there are many subscribers whose lines are worked at a loss.

* * *

The Tunbridge Wells corporation seems to have gone into the telephone business without a proper understanding of its peculiarities. Continual development and continual investment of fresh capital are features inseparable from a successful telephone business. If low rates are made, and the business is actively advertised and pushed, there will be rapid development of the telephone system in any place, and rapid development naturally calls for constant investment in new construction. The plant must naturally be kept ahead of the immediate requirements and a certain amount of the investment will always be locked up in spare plant that is not earning money for the moment. This fact, judging from the innumerable discussions of municipal telephony in England, the worthy town councillors and their telephone advisers seem unable or unwilling to appreciate, though it is one that every experienced telephone engineer is familiar with and allows for in all his plans and estimates.

* * *

The conditions under which the telephone business is run differ so much in different places that there is little profit for the present in discussing the particular features of the telephonic troubles just now assailing Tunbridge Wells, although some useful lessons may perhaps be drawn from them when the facts are more fully published. As to the actual results flowing from the competition that has been carried on for nearly two years between the Tunbridge Wells Corporation and the National Telephone Company we get some interesting data from our aggressive contemporary *The Electrical Times*, which is a staunch upholder of competitive telephony in general and of municipal telephony in particular. It seems that as far back as 1896 there was an outcry against the exorbitant tariff and execrable service of the National Telephone Company. "To all appeals the company turned a deaf ear. At that time there was no escape from the company's monopoly, for local authorities had no power to provide telephones. But Tunbridge Wells, like Glasgow, kept pegging away in the cause of cheap telephony until the Telephone Act of 1899 was passed, and it lost no time then in

obtaining a license and providing a telephone service at various rates of which the maximum was £5 17s. 6d. (about \$29). Thereupon the N. T. C. decided to kill the new competitor by adopting an unremunerative tariff. Had it reduced its £8 tariff to £7 while yet there was time, the competition would have been averted, but it refused; only to cut the figure down to £4 when the municipality entered the lists. That move did it little good. The new municipal concern gathered subscribers at a pace that exceeded the most sanguine estimates. It has to-day, roughly speaking, as many instruments connected up as the old-established N. T. C. system."

* * *

According to the published figures there were only about 112 subscribers in the Tunbridge Wells system in 1896, before general dissatisfaction with the rates and service were made manifest, and not many more several years later when the municipal system was started and the era of competition and rate-cutting begun. At the present time there are on both systems 1,688 subscribers, so that the municipal telephone scheme has had the result of rapidly developing the telephone service in an area that previously was practically not telephoned at all. The two systems had no intercommunication and some 200 subscribers had both services, but even allowing for this duplication, competition and low rates have resulted in producing more than twelve times as many telephone users in a couple of years as monopoly and high rates had been able to find in a considerably longer period. Those who favor municipal telephony are certainly able to show that the competition at Tunbridge Wells has given a remarkable impetus to the development of the telephone in the district and has effected a permanent lowering of the rates, as the National Telephone Company agrees not to charge higher than \$30, being \$10 less than the rate charged previous to competition.

* * *

Taking these facts into consideration *The Electrical Times* points out that the Tunbridge Wells Town Council's venture can by no means be called a failure. Cheap telephones are assured to the bulk of the Tunbridge Wells subscribers as long as the National Telephone Company's license lasts. The company will have had to grant greater concessions than would have confirmed it a few years ago in its monopoly, and will further have to bear the cost of the competitive service by which it has been coerced into submission. The town will have gained the cheap telephone service that it wanted, and will have its outlay recouped in full. "If that be failure, then many another town will be anxious to fail in like manner. To get £2 knocked off the tariff without losing a shilling seems good enough for any town." The effect of this defeat, thinks *The Electrical Times*, will work much damage to the National Telephone Company throughout the country, and that journal considers that Tunbridge Wells has triumphantly vindicated its policy of bringing the company to reason by running a rival system.

* * *

The automatic telephone has bobbed up again in Europe, this time in Paris. It is reported that the French Postal Administration has again undertaken a series of experiments with automatic telephone apparatus. The first series was undertaken in 1900, and had for its aim to allow subscribers to communicate automatically among themselves, and public call stations to communicate with subscribers and to efficiently register at the same time the number and duration of the connections. For the present experiments four new automatic installations have been placed in various offices. As in the machines first tried, it is only necessary to slip in coins to the value of 15 centimes (3 cents) after asking for the communication, and the remainder is done automatically. So soon as the time allowed has elapsed, communication is automatically interrupted, and a further 15 centimes must be inserted if the conversation is to be continued. The present experiments will definitely establish whether it is possible to have a regular automatic service. Further details and information as to the exact scope and results of the experiments will be looked for with interest. Apparently the experiments are directed more to an automatic toll station than to an automatic service properly speaking.

The Arrester.

TELEPHONE DEVELOPMENT IN PENNSYLVANIA AND MARYLAND

By J. W. LATTIG

PENNSYLVANIA and Maryland may now be said to be strong Independent telephone States. There are exchanges operated independent of the Bell in all important cities and in most of the smaller towns. These are connected by toll and long distance lines, which practically cover the States.

Almost as soon as the basic Bell patents expired, numerous small Pennsylvania and Maryland towns, which had long desired telephones, but with which, on account of their size, the Bell would have nothing to do, went into the business for themselves. The prominent citizens financed and organized a telephone company, and built a system.

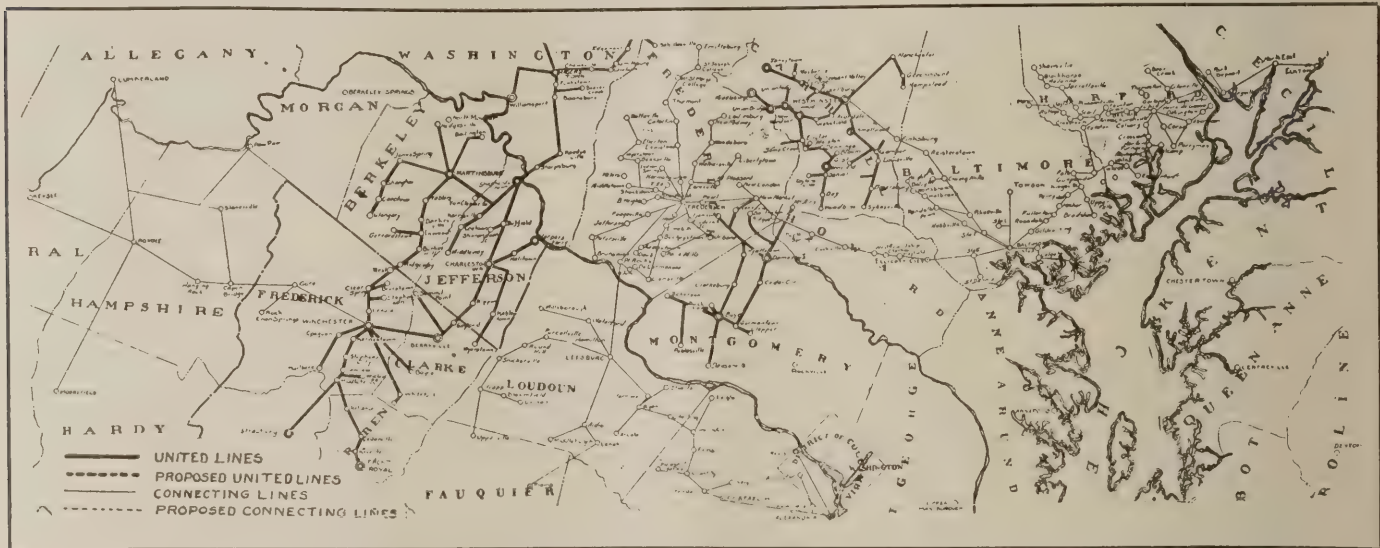
Not having had any telephonic experience, and being unable to secure experienced engineers, these first systems were naturally most crude and poorly constructed. The cheapest apparatus and materials were used, and installed with no regard to standard telephone usages.

The result was that the service was far from being satisfactory.

In the fall of 1900, several prominent men in the State of

phone Company, May, 1898; Ambler Telephone Company, March, 1900.

On November 7, 1901, the backers of the United Company, incorporated the Cumberland Valley Telephone Company for the purpose of consolidating the small Independent companies in Maryland. It is capitalized as follows: Capital stock, \$1,000,000; bonds, \$1,500,000. The following are the underlying companies comprising the Cumberland Valley Company, with the dates of their incorporation: Hanover Telephone Company, October, 1894; Western Maryland Telephone Company, of Baltimore City, August, 1897; Cumberland Valley Telephone and Telegraph Company, January, 1898; Franklin and Fulton Telephone Company, February, 1898; Juniata Telephone and Telegraph Company, March, 1898; Southern Pennsylvania Telephone Company, August, 1898; Spring Telephone Company, May, 1899; Tuscarora Telephone Company, September, 1899; Dauphin County Telephone Company, May, 1900; Juniata and Susquehanna Telephone Company, November, 1900; Cumberland Valley Telephone Company, July, 1901; Cumberland Valley Telephone Company, of Baltimore City, July, 1902.



MAP SHOWING LINES OF THE UNITED TELEPHONE AND TELEGRAPH COMPANY IN MARYLAND, VIRGINIA AND WEST VIRGINIA.

Pennsylvania, the most active of whom was W. D. Barnard, conceived the idea of forming one large Independent Company to take over the business of the numerous small companies. After overcoming many difficulties, the United Telephone and Telegraph Company was incorporated December 21, 1900, in the State of Delaware. It was incorporated in Pennsylvania on January 30, 1901.

The capital stock of the United Telephone and Telegraph Company is \$2,000,000. It has also issued bonds to the amount of \$2,000,000.

The companies that were consolidated under the management of the United Company, in the order of their incorporation, are as follows: Shamokin Valley Telephone Company, December, 1894; Schuylkill Telephone Company, May, 1895; Octoraro Telephone and Telegraph Company, August, 1895; Home Telephone Company of Lewisburg, August, 1895; Delaware County Telegraph and Telephone Company, September, 1895; Altoona-Phoenix Telephone Company, September, 1895; Keystone Telegraph and Telephone Company, June, 1896; North and West Branch Telephone Company, July, 1896; Peoples' Telephone and Telegraph Company of Lebanon, March, 1897; Phoenixville Telephone Company, August, 1897; Chester County Telegraph and Telephone Company, February, 1898; Independent Telephone Company of Lancaster County, April, 1898; Central Commercial Telephone Company, May, 1898; Montour and Columbia Tele-

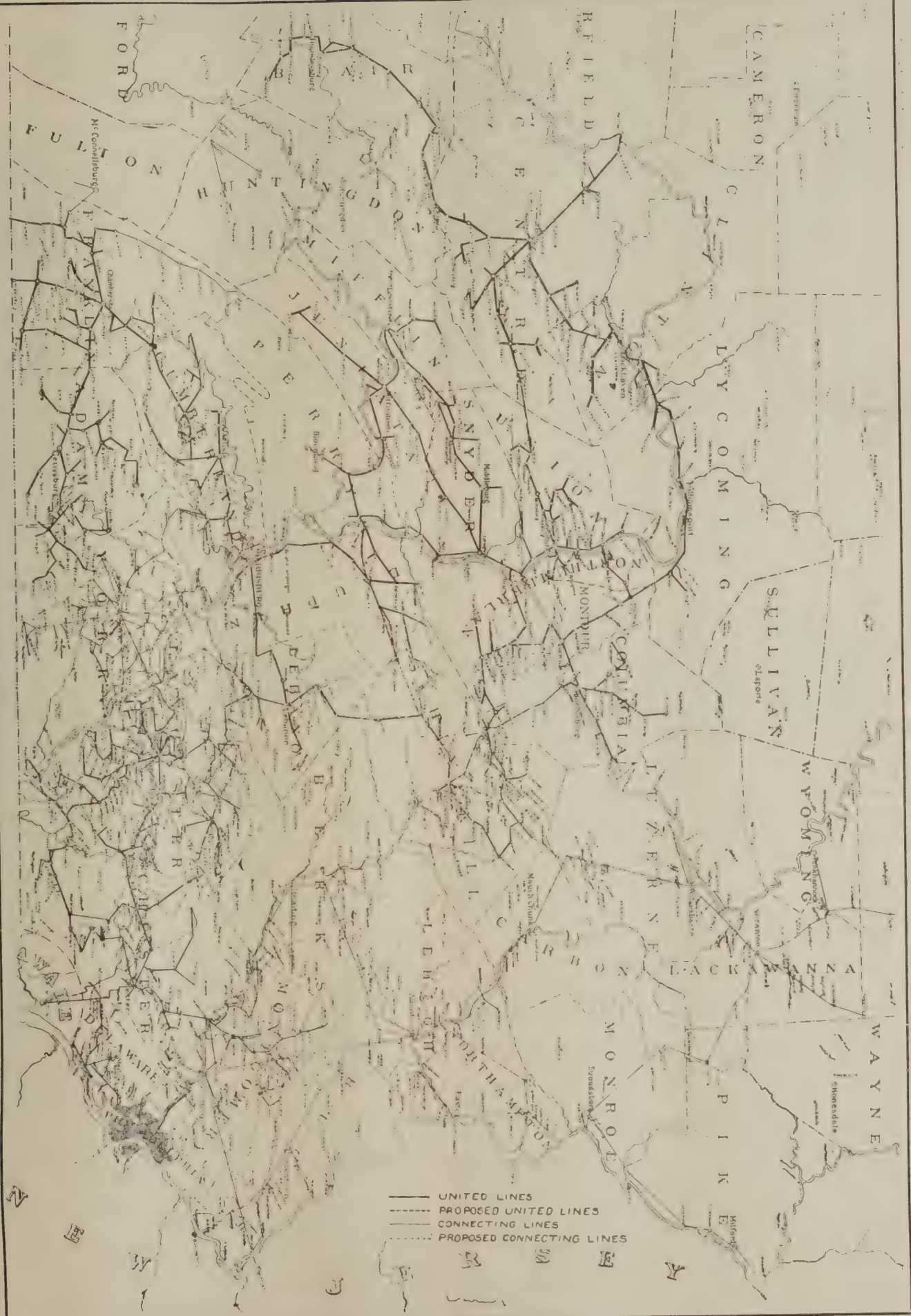
phone Company, May, 1898; Winchester Telephone Company, Winchester, Va., incorporated February, 1896, is also owned by the same interests.

The officers of the United Telephone and Telegraph Company are: Richard G. Park, president; W. D. Barnard, vice-president; E. A. Scott, secretary; S. R. Caldwell, treasurer; C. M. Clement, general solicitor; Ward R. Bliss, general counsel; J. W. Lattig, general superintendent; F. D. Houck, traffic manager; R. V. Page, auditor, and C. L. Goodrum, chief engineer.

The directors are: R. G. Park, F. G. Hobson, E. Davis, W. D. Barnard, J. F. Black, D. McK. Lloyd, E. M. Leader, F. H. Seely, W. G. Park, H. H. Light, E. L. Orvis, S. P. Light, W. R. Bliss, H. C. Harner, W. W. Ryon, G. W. Taft, B. F. Meyers, C. M. Clement, G. R. Van Alen, E. M. Yarnall, J. B. Krause, H. S. Thompson and F. C. Angle.

The total number of exchanges operated by both companies is 140, the principal exchanges being in the following cities: Norris-town, Pottstown, Phoenixville, West Chester, Chester, Media, Coatesville, Downingtown, Oxford, Gap, Quarryville, Lancaster, Ephrata, Lititz, Lebanon, Pottsville, Tremont, Orwigsburg, Tamaqua, Mahanoy City, Shenandoah, Girardville, Ashland, Mt. Carmel, Shamokin, Bloomsburg, Berwick, Danville, Sunbury, Northumberland, Milton, Lewisburg, Watsonstown, Selinsgrove, Mifflinburg, Adamsburg, Lewistown, Mifflintown, Newport,

MAP SHOWING LINES OF THE UNITED TELEPHONE AND TELEGRAPH COMPANY IN PENNSYLVANIA.



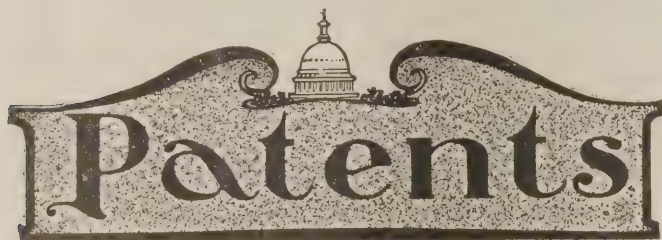
Muncy, Williamsport, Jersey Shore, Bellefonte, Lock Haven, Centre Hall, State College, Altoona, Hollidaysburg, Tyrone, Patton, Harrisburg, Steelton, Mechanicsburg, Carlisle, Newville, Shippensburg, Chambersburg, Mercersburg, Green Castle, Waynesboro, Fayetteville, Gettysburg, New Oxford, Hanover and York Springs, in the State of Pennsylvania; Westminster, Damascus, Boyd, Hagerstown, New Windsor and Middleburg in the State of Maryland; Winchester, Berryville and Front Royal, in the State of Virginia; Martinsburg, Sheperdstown, Charles-town and Harpers Ferry, in the State of West Virginia.

The total number of subscribers at the present time is 17,500. The company owns in all about 2,000 miles of main trunk lines for toll purposes. All recent construction is standard.

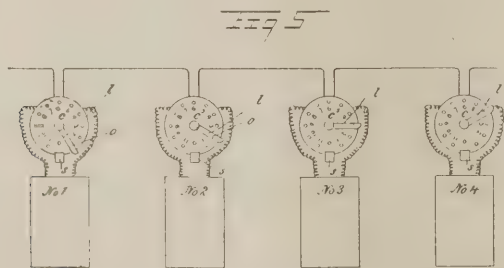
The Pennsylvania corporation has acquired all of the larger Independent companies in operation, as well as rights and franchises for the undeveloped territory in Pennsylvania east of Altoona, except the northeastern part of the State containing the cities of Wilkesbarre, Scranton, Hazleton, Reading and Allentown. These properties are in the territory of the Consolidated Telephone Companies of Pennsylvania, with which the United Telephone and Telegraph Company has made a traffic agreement and several trunk line connections, so that the subscribers of one company can freely communicate with those of the other.

The United Telephone and Telegraph Company is rapidly acquiring much territory in eastern and northeastern New York State and already has plants in operation in Elmira, Binghamton, Troy, Saratoga, Schenectady and Glens Falls, which within the next six months will be connected with the United Telephone and Telegraph Company by main trunk lines.

The total net revenue for the year was approximately \$60,000. The receipts from tolls at the present time average approximately \$40,000 per annum, having increased over 400 per cent. in one year and are steadily increasing at a rapid rate. The list of subscribers is increasing normally from 200 to 300 each month.

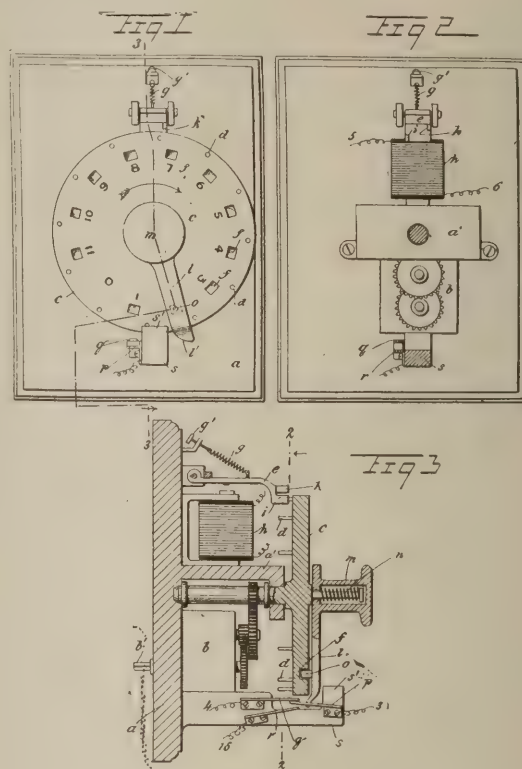


John A. Warrick, of Sheldon, Ill., patents (No. 714,540) a selective calling apparatus for party lines. Mr. Warrick's invention relates chiefly to signalling devices to be placed upon factory systems or so-called speaking tube outfits, in which there is no central station, but where the installation consists of a number of parties, all upon one line, who have occasion to frequently call each other. The object of this invention is to provide a method of signalling so that each party may individually call any other one and at the same time to render the line secret. Figs. 1, 2 and 3 show the details of the apparatus, while Fig. 4 gives the circuits.

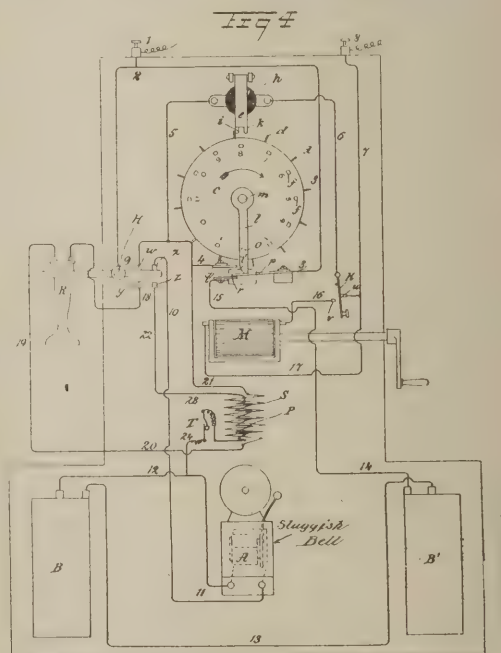


Upon the base A is mounted a train of spring-driven clock work B, and a revoluble disk C, having on its inner face the pins D and on its outer face the notches F. The movement of the disk is controlled by the escapement E, provided with the pallets I and K, actuated by the electro-magnet H, which is normally connected with the main line. When the magnet is excited the escapement E is drawn down, allowing the disk to traverse a step represented by half the distance by two consecutive pins. Mounted on the face of the disk is a hollow knob M, provided with an arm L rigidly connected therewith, the arm being provided with a boss O. The spring N holds the knob close to the face of the disk, but it may be pulled out of gear and the boss disengaged from the disk so that the arm can be moved. There is a post S pro-

vided with an overhanging piece S¹, so arranged that the arm L can pass under this overhanging piece if the boss is in one of the notches; but it will not allow the arm to pass in any other position. Thus each subscriber can turn the arm at will, but the arm cannot pass the overhanging piece without causing it to engage and move the disk.



In Fig. 5 a complete line is shown. Suppose No. 1 wishes to talk to No. 4, he sets the arm to the numeral 4 on the disk, then, by means of a magneto, sends several impulses into the line, exciting the electro-magnet of every station and causing its disk to rotate one step at a time. No. 1 has placed his arm in the slot



4, No. 4 has his arm normally in slot 4, thus two disks revolve synchronously, and when their arms touch the overhang the bell of No. 4 rings, and it is the only one which answers. Thus 1 and 4 are in communication. Supposing now No. 2 wishes to listen in. He can move the arm L from the disk, but cannot get the arm from the overhanger except by engaging in one of the notches and moving his own disk. This moves the disks of subscribers who are talking and cuts off the conversation, thus securing the secrecy.



The Week's Messages.

New Companies

PEARL CITY, ILL.—Articles of incorporation issued to the Pearl City Telephone Company have been filed. Incorporators: Dr. W. E. Clay, Ira Lowry and Calvin Barklow, who have subscribed for equal amounts of the \$15,000 capital stock.

ARLINGTON, IND.—The Arlington Telephone Company, of Arlington, has filed articles of incorporation with a capital stock of \$4,000. The directors are James M. Cross, Charles Sampson, John P. Downey, J. Frank Smith, Elihu Price, James E. Minden, John M. Eaton, William Jordan and Robert H. Moore.

CRAWFORDSVILLE, IND.—The Crawfordsville Co-Operative Telephone Company has been incorporated with a capital stock of \$10,000. Incorporators: M. E. Clodfeller, C. R. Beck, J. I. Miller, Clinton Snyder, W. H. Nicholson, Chas. L. Harris, Clarence Williams, W. L. Sinnet, L. F. McMullen, Mrs. Mary E. Van Cleave, George N. Bowers and Clyde H. Jones.

VAIL, IA.—Articles of incorporation have been filed by the Vail Telephone Company, of Vail, Crawford County, with a capital of \$10,000.

WASHTA, IA.—The Farmers' and Merchants' Telephone Company has been incorporated with a capital stock of \$10,000. Incorporators: James Robertson, Jr., A. H. Stivers, Thomas Williamson, U. C. Rogers, H. A. Pinckney, J. H. Duart, M. McGregor and George E. Snidecar.

HANCOCK, MASS.—A mutual telephone system is being organized here and in Stephentown. An organization has been effected with C. H. Wells, president; G. B. Sweet, treasurer; K. E. Gardner, C. H. Wells, O. B. Butterfield, building committee.

HYANNIS, MASS.—A movement is on foot to install a new local telephone line in Hyannis. There are continued complaints over the gradual curtailment of territory covered and original privileges by the old company. The inducements originally offered to subscribers have been minimized so that subscribers now feel that the cost of the service overbalances the benefits. The contracts give to local subscribers free intercourse within the Hyannis exchange. Of late other exchanges have been established at different points within the original territory of Hyannis exchange, and now fees are collected for connection with subscribers within the new exchange limits.

NORTH BRANCH, MINN.—The Maple Leaf Telephone Company, of North Branch, has been incorporated with a capital stock of \$50,000. Incorporators—F. F. Murray, Charles Avery, J. R. Briggs, A. V. Plunkett, O. W. Fagerstrom, of North Branch.

BLOOMFIELD, NEB.—The Union Telephone Company, of Bloomfield, Knox County, has filed articles of incorporation with a capital stock of \$25,000. The incorporators are P. F. Murray, J. C. Hass, E. H. Mason, T. Coe Little and T. A. Anthony.

SANTA FE, N. MEX.—Articles of incorporation have been filed here for the Tucumcari Telephone Company by James A. Street, Alexander D. Goldenburg, Will B. Jarrell, Jacob Wedtheim and Theodore W. Heman, to establish a telephone system in Tucumcari and Guadalupe County. The capital stock is \$5,000.

MILTON, N. D.—There is strong talk of a telephone line between Milton and Olga with a chance good for an extension to Walhalla.

CINCINNATI, O.—The Cincinnati Telephone Company has been incorporated by Robert W. Seebaum, G. Sheldon Browne, R. C. McCracken, Jr., John S. Nowatny, James P. Hughes. Capital stock, \$50,000.

WESTON, O.—The Weston Home Telephone Company has been organized and incorporated. This company supplants the Farmers' Mutual Telephone Company, which has been in operation in and about Weston for some time. The officers of the new company are: President, M. Brundage; treasurer, Dr. G. B. Spencer.

SANDPATCH, PA.—A party of Greenville township residents have formed the Economy Telephone Company, to erect a telephone line from Sandpatch to Pocahontas, thence to Finzel, Md., and from there into Salisbury.

ABILENE, TEX.—The Northwestern Telephone Company, of Abilene, has been incorporated with a capital stock of \$75,000. The incorporators are: W. G. McCreight, D. M. Howard, J. L. Loveless and J. C. Richardson, of Mineral Wells; J. L. Cunningham, of Palo Pinto; J. W. Stenson, of Strawn; M. Weaver, J. Hewitt, J. S. McCreight and R. G. McCreight, of Abilene.

McKINNEY, TEX.—The Roland Local Telephone Company, of McKinney, Collins County, has been incorporated with a capital stock of \$5,000. The incorporators are C. T. Lewis, C. H. Farnsworth and others. The purpose is to maintain a telephone line from here through the counties of Grayson, Cooke, Dallas, Tarrant, Rockwell, Hunt and Fannin.

Legal

ATLANTA, GA.—Application has been made to Judge Newman in the United States Court for a decree for the sale of the property of the Standard Telephone Company under a mortgage given to the City Trust Safe Deposit and Security Company of Philadelphia to secure an issue of \$550,000 worth of bonds.

Financial

CHILLICOTHE, ILL.—The capital stock of the People's Telephone Company, of Chillicothe, has been increased from \$10,000 to \$20,000.

HOLMES CITY, MINN.—The Interurban Telephone Company, of this city, which recently purchased the Park Region Company, of Alexandria, has reincorporated and increased its capital stock to \$100,000.

ROCHESTER, N. Y.—At a meeting of the directors of the Stromberg-Carlson Telephone Manufacturing Company, dividends of one and three-quarters per cent. on the preferred stock and two per cent. on the common stock of the company were declared, payable January 1 to stockholders of record at the close of business December 20, 1902. The books of the company will close December 20 and reopen January 1, 1903.

CARLISLE, PA.—The City Council has decided that hereafter a tax of 75 cents must be paid annually for each telegraph and telephone pole, and \$2 for erecting each new pole.

Rates

WAUPACA, WIS.—After January 1 the Citizens' Telephone Company's rate for business telephones, single lines will be \$1.50 per month; two or more on party lines \$1.00 per month; residences, \$1.00 per month.

Elections

TULARE, CAL.—At a meeting of the stockholders of the People's Telephone Association, of which C. F. Pratt is manager, S. B. Anderson was elected auditor and Frank Stiles and C. E. Dresser were constituted a finance committee. Shares of stock were advanced from \$1 to \$1.50 per share. The company feels much encouraged to go ahead and extend the service and increase its efficiency.

BELFAST, ME.—At the annual meeting of the Belfast and Liberty Telephone Company, of Liberty, the following officers were elected: President and Superintendent, J. J. Walker, Liberty; vice-president, E. Cobb, Searsmont; board of directors, J. F. Vickery, Morrill; V. Thompson, Montville; V. A. Simmons, Searsmont; G. B. Dyer, Searsmont; J. O. Johnson, Liberty. It has been voted to extend the line to McFarlands Corner and Halldale, in Montville.

Combinations

EVENING SHADE, ARK.—John S. Medley has bought the telephone line to Sidney from the Long Distance Telephone Company, and will soon have it in operation.

PADUCAH, KY.—The formal transfer of the Alexander Telephone Company, of Madisonville, which is operated in fourteen counties, to the Independent telephone line of Paducah for \$50,000, has been made by Mr. Alexander.

THE WEEK'S MESSAGES *Continued.*

Franchises

ANNISTON, ALA.—At a recent meeting of the City Council the Home Telephone Company, W. E. Knox, trustee, and O. H. Parker & Company asked for a thirty years' franchise for erecting and maintaining telephone lines in the city. The ordinances will be considered and the matter definitely decided at the next meeting of the Council.

JASPER, ARK.—The City Council has granted a franchise for a local telephone exchange to Mrs. Annie Moore, of Jasper. The rate for service is fixed at \$1.00 a month.

COVINA, CAL.—At the sale of a franchise for a telephone system here, E. R. Fox secured the franchise by bidding \$175, against \$31.80, bid by the Covina Home Telephone Company. Now that he has the franchise Fox doesn't want it, and it is considered probable that he will sell to the Home Telephone Company.

PORTERSVILLE, CAL.—C. F. Pratt, of Tulare, manager of the People's Telephone Company, has asked for a franchise to construct and operate a system here. The following towns are now embraced by this company: Tulare, Visalia, Farmersville, Exeter, Venice, Tipton and Goshen. Lines are ready to be extended to Lindsay and Portersville as soon as the franchise through the latter place shall have been granted.

KANKAKEE, ILL.—The City Council has granted a twenty-five-year franchise to the Interstate Independent Telephone and Telegraph Company.

ROCKFORD, ILL.—The Boone County Telephone Company presented a petition to extend the line from Boone to Winnebago County. D. Ralston and Mr. Picken left the papers for signatures.

TERRE HAUTE, IND.—The Kinlock Telephone Company, of St. Louis, has asked for a franchise for a long distance line from the Illinois State line to Terre Haute. The company has its line completed from St. Louis to Casey, Ill., and wants to connect with the Citizens' Company of Terre Haute and thereby establish direct connection with the long distance system of the Indiana Independent lines through Indianapolis.

ST. PAUL, MINN.—The Twin City Telephone Company has been granted a franchise to erect additional poles and string wires in the streets of this city.

OMAHA, NEB.—W. C. Lambert, attorney for the Interstate Independent Telephone Company has accepted the franchise granted by the city.

LAMBERTVILLE, N. J.—The supplement to the ordinance granting to William S. Newman and Samuel J. Pickering the right to operate a telephone line, transferring said rights to the Merchants' and Farmers' Telephone and Telegraph Company has been passed.

RIVERTON, N. J.—William W. Olheiser, general superintendent of the Eastern Telephone and Telegraph Company, has applied to the township committee for permission to construct and operate a telephone line in Palmyra in connection with the system in Camden and Philadelphia. The matter has been referred to the solicitor to prepare an ordinance.

PULASKI, N. Y.—The Black River Telephone Company has instruments connected with its Lowville exchange and has just secured a franchise here and will extend its lines to this place.

CHATTANOOGA, TENN.—The Independent Telephone Company, of El Paso, Tex., has purchased the Wilcox telephone franchise granted some time ago with the exclusive privilege of laying conduits along the streets of Chattanooga and establishing another telephone exchange. The Texas company proposes to expend \$100,000 in the venture, but will ask the City Council the privilege of doing away with the conduit feature of the franchise, as far as public uses are concerned, only asking for their use to lay its own wires. The company guarantees to have the new system in operation within twelve months.

SALT LAKE CITY, UTAH.—The city council on November 24 granted a fifty-year franchise to the Utah Home Telephone Company, thus ending a long and bitter fight made against it by the Bell Company. The Home Company numbers among its officers and directors Heber M. Wells, Governor of Utah; John Henry Smith, brother of the president of the Mormon Church, and a number of prominent business men of Salt Lake City. The promotion of this enterprise has been in the hands of E. W. Hammer and associates, of Chicago. It is the intention to begin construction as soon as material can be delivered.

WYTHEVILLE, VA.—The franchise asked for by the new Mutual Telephone Company, of this county, to enter the town of Wytheville and place its poles and string its wires on the streets and alleys of the town, has been practically granted by the Town Council. The company cannot charge a rental for its telephones of more than twelve dollars per annum; if the stockholders ever number less than twenty the franchise is revoked, this restriction being imposed to prevent the concern from passing into the hands of one or a few men, and thus ceasing to be a mutual company.

Construction

LEMARS, IA.—Another new enterprise which connects with this town is the Farmers' Mutual Telephone Company No. 1, and consists of farmers

living west and south of LeMars. At a recent meeting G. G. Keonig was elected president, and Mr. A. Hilger secretary and treasurer for the company. The entire material for this line has already been ordered, and the prospects are that the line will be in operation by January 1.

NATONA, KAN.—The telephone extension to Osborne and Russell will be built as soon as the necessary material arrives. Work will soon be commenced at the Russell end to connect with the line at Fairport. Many farmers between here and Osborne are subscribing for stock. The general office of the concern will be located here.

SMITH CENTER, KAN.—A new telephone line is being constructed to Cora, which is to connect with the Womer and Reamsville line, eight miles north of this city.

ALBANY, KY.—The Gainsboro Telephone Company, of Gainesboro, Tenn., is preparing to erect a long distance telephone line from Albany to Burkesville.

PETERSBURG, KY.—The Boone County Telephone Company will extend its lines to Bellevue and Rabbit Hash, where connection will be made with the Southern Indiana Association by cable under the Ohio River.

POOLE, KY.—The Poole Independent Telephone Company is building new lines all over the county surrounding this place. The system has grown from twelve subscribers to 148 in the last eighteen months.

CALAIS, ME.—Dr. Lemuel Brehant is making preparations for a further extension of his lines. He has now opened up his private line as far as West Pembroke and completed the circuit to Meddybemps.

FREDERICK, MD.—The Frederick County Telephone and Telegraph Company has determined to extend its line from Petersville to Burkettsville, and work preliminary to the extension has been begun. The line will go from Petersville via Tyrconnel, and may ultimately be extended to Broad Run. Poles will be secured in that locality and will be planted as rapidly as possible, after which it will require about four days to string the wire. The extension of telephone facilities to Burkettsville will open up an entirely new section to telephone privileges.

GRAND RAPIDS, MICH.—The Citizens' Telephone Company is now looking over the entire field of up-to-date switchboards, and within a short time will probably purchase its complete apparatus for installation in the new exchange building. A board capable of taking care of 5,000 lines at the outset will be installed, with maximum capacity of 16,000 lines. Two new boards have just been ordered for the Lansing exchange, and the company has nearly 1,600 telephones in use there.

HOWELL, MICH.—The officers of the Livingston Mutual Telephone Company closed a two-year contract with the Livingston Home Telephone Company whereby the former is to connect with the latter at this place. The work of constructing the Livingston Mutual line is to begin very soon. The purpose of the Mutual is to develop the entire county.

HOWELL, MICH.—The Livingston Mutual Telephone Company has been organized and is about to construct a line from Pinckney through Marion Township to Howell. Poles and supplies have been ordered, and the intention is to commence work soon. The company also has plans for branching out to other parts of the county. A meeting was held to complete arrangements for the new project. The company is capitalized at \$10,000, divided into 200 shares of \$50 each, one share giving its holder a telephone with the free use of the line. Work has already commenced.

MANCELONA, MICH.—The Swaverly telephone line is being built from here through Central Lake, through Bellaire. Later the line will be extended to Charlevoix.

KANSAS CITY, MO.—As soon as the necessary permits are granted the Home Telephone Company will begin the erection of the pole lines.

BILLINGS, MONT.—E. M. Hungerford, superintendent of the Moffitt telephone lines, local and long distance, reports many improvements on the line and much work still in sight. In installing the local plant nothing but the very latest appliances were used. Mr. Hungerford also states that his company has just completed a first-class metallic circuit to Red Lodge, and also to Park City, the latest division of the line being known as the Yellowstone Valley division. The Wyoming lines have also been put in good shape for the winter. The company put in an exchange at Basin recently and also added fifteen telephones to its switchboard at Cody. In Billings it has just completed stringing 1,000 feet of cable, which thoroughly connects the north side, and has about 1,600 feet to string to connect the south side.

BINGHAMTON, N. Y.—Within two months the line of the Binghamton Telephone Company, connecting Binghamton with Cortland, will be completed. All that remains to be done in that direction is the extension of the company's lines from Barker northward to the county line. At Cortland connection can be made with Syracuse, and the other large and small towns and cities of Central New York. As soon as this work is completed the company will take up the construction of a line to Elmira. Work on this line has already been started at the Elmira end. At Elmira connection can be made with the Inter-Ocean Telephone Company. Within a short time thereafter the lines of the United Telephone Company of Pennsylvania will be extended from Williamsport to Elmira. Then connection can be made from Binghamton by way of Elmira as far south as Virginia, in-

THE WEEK'S MESSAGES *Continued.*

cluding Philadelphia, Pittsburg and all the big cities of the Keystone State. The Binghamton Telephone Company now has 1,380 subscribers.

BUFFALO, N. Y.—An extension of the powers of the Independent Union Telephone Company is granted in amended papers of incorporation which have been filed in the County Clerk's office. The company proposes to amend its original plans by extending the field of its operations in and beyond the limits of the States of New York, Pennsylvania, New Jersey, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire and Maine. The company intends to establish telephone lines in Buffalo, Rochester, Albany, New York, Brooklyn, Philadelphia, Jersey City, and cities and towns in the other States mentioned.

BURLINGTON, N. Y.—There is some talk of building a new farmers' telephone line from Garrattsville to this place. The line between Emmet Bolton's and this place will be soon completed.

MARATHON, N. Y.—The Home Telephone Company will install a local exchange at Marathon.

JACKSONWALD, PA.—The Consolidated Telephone Company has a large force of men at work in erecting poles. The main line will be built from Boyertown to Reading, with extensions to different places in the near future.

LANCASTER, PA.—The Enterprise Telephone and Telegraph Company, which has been organized by farmers and merchants to construct a telephone system through the eastern and northern parts of the county, has started work on this line.

LE RAYSVILLE, PA.—The Tunkhannock & Wyoming Valley Telephone Company is contemplating a line up the river, taking in Mehoopany, Meshoppen, Laceyville, Wyalusing and Towanda. At Towanda it will connect with the Bradford County Telephone Company. The Rush Telephone Company now owns a line from Lawton to Montrose and is talking about building a line to Stevensville and would do so at once if a line from here to that place was put up.

NEWTOWN, PA.—The Standard Telephone and Telegraph Company's men are running a line from Newtown to Willow Grove, where connection will be made with the Keystone Telephone Company's line, and thus afford service to Philadelphia.

PHILADELPHIA, PA.—The Keystone Telephone Company continues to extend its field of operation, and it is expected that the northern section of the city will be included in the service by January 1. The new exchange will be opened at that time. Lines to Germantown, Chestnut Hill and other suburbs are being constructed, and will be completed by April 1. The Keystone has been in operation less than a year, and in that time, according to its officials, upward of 20,000 telephones have been installed or secured by contract. Under the direction of the Keystone State Telephone Company extensions are being made beyond the city limits for long distance service. Traffic arrangements have been made with various Independent telephone lines, which, it is said, will continually extend over the country so far as it is practicable to talk. Fifteen trunk lines have been constructed as far as the Maryland line, where they will be connected with the system of the Maryland State Telephone Company, through which service with the South and West will be established.

XENIA, O.—The Home Telephone Company will be connected with the United States Long Distance telephone line, which is shortly to be built through this country, from Xenia to Yellow Springs.

HIGHMORE, S. DAK.—A local exchange has been installed for the Hyde County Telephone Company, of which A. N. Van Camp is manager. The company is an incorporated stock company, in which about all of the leading business men of the town have taken stock, and starts with prospects of great success. It is the intention of the company as soon as possible to extend lines into the country in several directions.

KIMBALL, S. DAK.—Interest is renewed in the telephone exchange which is proposed by the Brulé Telephone Company incorporated some time ago. A subscription paper is being circulated asking subscriptions to the service when put in, and subscriptions to the stock. The citizens generally are giving support to the enterprise, and it is practically certain that work on it will begin in the early spring.

BIG STONE GAP, VA.—It is reported that a line is soon to be constructed from Stonega, Va., across Black Mountain to Whitesburg, Ky.

MASSAPONAX, VA.—There is a movement on foot to construct a branch of the Spotsylvania telephone line from here to Chilesburg in Caroline County.

NORTH YAKIMA, WASH.—It is planned to extend the line of the Sunnyside Co-operative Telephone Company, which already reaches practically all the farmers of the Sunnyside country, including Mabton, Prosser and Toppenish, to connect all farmers in the Yakima Valley. The line is now completed northward as far as Parker, and if the extension is made it will be run over the Yakima Hills to Moxee, thence to this place and then up the various tributary valleys. The cost of this line to each subscriber will be \$50, entitling the holder of a telephone to one share of stock in the company and one vote, with the privilege of selling the stock and instrument at any time to some one who is not already a stockholder. The

cost per annum will be 25 cents per month for exchange and \$1 per year dues. This entitles the subscriber to free usage of the telephone to all parts of the valley. H. M. Gilbert has already sounded the North Yakima business men on the proposition and a number of them have assured him that they will take stock. He will at once begin soliciting for stock among the farmers, and it is expected to have the line completed to this place by January.

JANESVILLE, WIS.—At a meeting of the directors of the Rock County Telephone Company the secretary was instructed to purchase a new two-hundred pair cable. The new cable will not replace any now in use, but was ordered on account of the increase in business.

WAUSAUKEE, WIS.—The Wausaukee Telephone Company has finished the construction work on its toll line to Coleman. The villages of Wausaukee, Middle Inlet, Crivitz, Beaver, Pond and Coleman are now connected. Preparations are now under way for extending the line to Marinette, and an effort will be made to get connection with that city this winter. Nothing will be done toward connecting the towns in the northern part of the county until next spring.

Miscellaneous

MOLINE, ILL.—The new Independent telephone company will open its Moline exchange for regular service January 1. By this time about 450 instruments will be connected and ready for service. When all the subscribers are given service the boards will show nearly 800 numbers.

TALLULA, ILL.—Boynton Telephone Company has 350 telephones, including sixty in the village. There are five country lines, which will average eight to the line, which are included in the total. There is a line to Ashland which has 45 telephones; one to Pleasant Plains, with 50 telephones; one to Berlin with 40 telephones; another to Virginia, with 40 telephones, and one to Curtis with 20 telephones. These connect with lines all over the country in every direction except north, there being as yet no direct line to Petersburg. The Tallula office has a new switchboard and a power generator just installed. The charge to the farmer is \$1.25 a month and the company furnishes the telephone and keeps it and the line in order. In town the charge is \$1 a month. This company has fully 200 miles of lines. The system was started only a year ago with 30 telephones, and now there are 400 and there is a constant increase. Five men are kept at work all the time.

RUSSIAVILLE, IND.—The Russiaville Co-operative Telephone Company will have free service with Frankfort and surrounding towns.

CAMBRIDGE, IA.—C. E. Larson is secretary of a telephone company organized with a capital of \$10,000 to build an exchange here.

TOPEKA, KAN.—The next annual meeting of the Kansas Independent Telephone Association will be held in Topeka during the second week of next January. The Executive Committee, composed of C. L. Brown, of Abilene; J. E. Byers, of Ottawa; W. H. Nelson, of Smith Center, and E. H. Berry, of Atchison, called the meeting recently; it will last for two days. The members of the association are very sanguine over their prospects, and state that by the end of another year they will have independent lines over the entire State. They have put in many new lines this year, and are still at work.

CLYDE, N. Y.—The Wayne County Telephone Company has about completed the installation of its telephone cable system in this village. When completed, the local telephone plant will constitute an ideal system, being equipped with the latest and most approved apparatus. Charles A. Lux, of Clyde, the president of the company, states that the Independent telephone system inaugurated by his company will build an equally efficient service throughout the entire county.

RENSSELAER, N. Y.—The Rensselaer Telephone Company has entered into a contract with the Eastern Telephone and Telegraph Company for connection with its toll lines. The contract is for five years. All connections will be in operation about the first of the next year.

DOYLESTOWN, PA.—The lines of the Standard Telephone and Telegraph Company which are to provide connections for the Bucks county system with the lines of the Keystone Telephone Company in Philadelphia are rapidly nearing completion. One pair of copper wires is strung from Doylestown to Hatboro, while another goes from Newtown to Hatboro. From this place the lines run direct to Glenside, at which place the connection is made with the Keystone wires. In case of accident to either line connections would still be available over the trunk between Doylestown and Newtown. It is also intended to provide other connections so that there will ultimately be five direct connections for Philadelphia. The other three will be at Hulmeville, Lansdale and Burlington, N. J. The Keystone Telephone and Telegraph Company is now securing borough ordinances and rights of way for a trunk line from Philadelphia to Trenton, via Hulmeville, and this line, it is expected, will be built very shortly. Five pairs of wires will be used for each of these several connections. The Standard Company's system has just been thoroughly overhauled and placed in good shape for the winter. Contracts for new telephones have been secured at various places, eighteen having just been signed in Langhorne, the total there now being

THE WEEK'S MESSAGES *Concluded.*

eighty-two. There are a hundred and sixty-six subscribers in Burlington, the number there having been growing steadily.

SPRING GROVE, PA.—A telephone line is being constructed from Spring Grove to Wiota. George W. Crist, of Wiota, is furnishing and putting up the poles. Connections will be made with York and Hanover lines.

KNOXVILLE, TENN.—Harry Roney has resigned his position with the Postal Telegraph Company, of Richmond, Va., to accept the position as general manager of the Hiawasse Telephone Company, which connects Knoxville with Sweetwater, Athens, Madisonville and Benton.

FREDERICKSBURG, VA.—At a meeting of the directors of the Fredericksburg and Rappahannock Telephone Company, held here, arrangements were made for constructing a line from Port Royal to this city.

SHEPHERDSTOWN, W. VA.—The United Telephone Company is stringing copper wires between Frederick and Winchester, which will be a part of the long-distance system to connect Virginia with Baltimore.

Personal

BUFFALO, N. Y.—H. N. Daniell, formerly wire chief and division operator of the Lehigh Valley, has accepted a position with the New York State Independent Telephone Company.

SOME STRONG ENDORSEMENTS

THE EMPIRE CONSTRUCTION COMPANY,
LOS ANGELES, CAL.

Editor, The American Telephone Journal.

Sir:—We enjoy the American Telephone Journal and desire to congratulate you as the father and founder of such a valuable and highly appreciated publication. It has no "carbuncles, freckles or warts," and is strictly "up" in its line, filling its mission "brim full."

F. F. GRAVES, General Manager.

H. G. NEWELL, TELEPHONE CONSTRUCTOR.
ORWELL, PA.

Editor, The American Telephone Journal.

Sir:—Can't get along without the American Telephone Journal.

H. G. NEWELL.

J. F. GROSSKLAUS, TELEPHONE AND ELECTRICAL
SUPPLIES.

NAVARRE, OHIO.

Editor, The American Telephone Journal.

Sir:—In looking over my file of the American Telephone Journal, Vol. 6, I find that I am short Nos. 1, 2 and 3, which I have given out as samples. I think the Journal too valuable to miss those numbers and break the current volume, so kindly favor me.

J. F. GROSSKLAUS.

TRADE NOTES

THE STANDARD UNDERGROUND CABLE COMPANY has nearly completed the erection of one of the largest and most modern plants in this country for rolling copper rods, drawing all sizes and shapes of bare wire, and insulating weatherproof wires and cables. This plant is an addition to its large underground cable factory and rubber insulated wire and cable factory at Perth Amboy, N. J. The company is prepared to furnish bare rods and wire in any quantities, the capacity of the rod mill being 3,000,000 pounds per month and the wire mill 2,000,000 pounds single turn. The weatherproof factory will be in full operation by February 1, 1903, with a capacity of 500,000 pounds of wire and cables per month working single turn. The sales department staff has been largely added to, on account of this new departure and the general increase of business. The general sales department, with headquarters in Pittsburg, together with the branch office managers at New York, Philadelphia and Chicago, remain the same.

Mr. A. B. Saurman, who has represented the company in Boston for the past few years, goes to San Francisco, where he is associated with Mr. C. F. Sloane, the Pacific Coast sales agent of the company, Mr. Saurman devoting his attention exclusively to the interest of the company on the coast. The Boston office is now in charge of Mr. Frank Clarke Cosby, formerly the company's representative in St. Louis, and latterly connected with the sales department of the W. E. & Manufacturing Company in New York City. The New York office force is augmented by the presence of Mr. H. P. Kimball, formerly with the Williamsport Electric Company. Mr. R. M. Hirst, for several years connected with the Philadelphia office, will devote most of his time to the trade in the territory covered by the Philadelphia office. The Pittsburg office will have two men constantly on the road, Mr. A. A. Anderson, who has been with that office for several years, and Mr. McBride, formerly with the Pittsburg Reduction Company. Mr. J. R. Wiley, at the Chicago office, will be assisted by Mr. E. J. Pietzcker, formerly with the American Steel & Wire Company.

PLANTS FOR SALE

Advertisements under this head \$1.00 for 25 words or less for each insertion. Prepaid.

INVESTMENT OPPORTUNITY.—Telephone plant, 1 year old, 195 subscribers, 85 miles toll lines in booming town, 4,000; connections with Independent long-distance lines in view. Good reason for selling out. Address A, care of AMERICAN TELEPHONE JOURNAL, N. Y.

LEASE:—Wanted to lease telephone or electric light property, by practical, all around electrical man with some capital. Address CAPITAL, care AMERICAN TELEPHONE JOURNAL, New York.

WANTED

Advertisements under this head, 25 cents for 25 words or less for each insertion. Prepaid.

WANTED—Sober, reliable young man as superintendent of 200 subscriber plant and outside work. Must be thoroughly competent in switchboard and instrument work of magneto and common battery system; hustler, capable of maintaining plant to highest efficiency, and know how to get best work from employees. Address, stating experience, references and salary expected, TELEPHONE, Lock Box 93, Elizabeth City, N. C.

POSITION WANTED by strictly temperate man, 25 years old, with seven years' experience in Independent and Bell systems. Experienced in all branches of work. References from former and present employers. South preferred. Address EXPERIENCE, care AMERICAN TELEPHONE JOURNAL, New York.

MANUFACTURERS: An engineer, experienced in designing common battery apparatus, and with excellent references, desires position with a good telephone manufacturing company. Address ENGINEER, care AMERICAN TELEPHONE JOURNAL, New York.

EXCLUSIVE handling of an account, for Chicago trade, beginning January 1st. Manufacturers Agency basis. Address SALESMAN, care AMERICAN TELEPHONE JOURNAL, Monadnock Building, Chicago.

A HOME IN SOUTHERN CALIFORNIA—I desire to communicate with a man capable of taking charge of a factory for insulating rubber-covered National Code wires. This is a splendid opportunity for the right man. References given and required. No money necessary. Address P. O. BOX 1116, Los Angeles, Cal.

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CONVENTION OF THE INTER-STATE ASSOCIATION

TO sum up the good results that will come of the convention of the Inter-State Independent Telephone Association, held in Chicago last week, is an impossibility. To even approximate their extent is a very difficult matter.

The Inter-State convention was on such a stupendous scale that even its most enthusiastic and optimistic friends were surprised. In point of numbers and real work accomplished, and, in fact, from every other standpoint, it completely overshadowed every previous gathering of telephone men.

The officers and members of the Inter-State Association have well-known conditions confronting them but at the same time there are always new situations cropping up that must be met. There are questions of operation and construction, toll line extensions and a host of others. More important even than these is the preparation of plans and tactics for combatting the common enemy—the Bell company. The most efficacious way to decide the former questions is for telephone men to come together as they did in Chicago. The only way to successfully fight the Bell is to bring the united strength of the Independent movement to bear.

Independent conventions have at times been found wanting in some respects. There has not always been the proper enthusiasm or interest.

The Inter-State was different in this respect as in most others. There was not only suggestion and discussion, but there was good strong action.

The resolution adopted by the convention excluding all telephone companies that use Bell instruments or connect with the Bell lines from the Association is especially to be commended. The worst move an Independent telephone company can make is to agree to use Bell instruments or connect with the Bell toll lines. There is no surer way to favor the Bell. As was truly said at the convention, a company that does this is not Independent and will in time become a part of the Bell unless it breaks off its relations.

The officers and those who have worked hardest in building up the Inter-State Association cannot be complimented too highly on the perfect organization they have perfected.

Mr. C. E. Hull, the newly elected president, has frequently demonstrated his capacity for strong, executive management. Under his administration the Association is certain to move forward during the next year as rapidly as it has in the past. He will have the benefit of the active co-operation of as strong a set of officers as were ever selected by any organized business body and he will also have the hearty support of Mr. Raney, the retiring president, who is easily one of the brainiest men in the business to-day. On Mr. Raney much of the responsibility of bringing the organization to its present high standing devolved. As a presiding officer he met every requirement. For the way he handled the convention last week, and for the able and tactful manner in which he presided over the banquet on the closing day, he is to be congratulated. To him much of the credit for the successful meeting is due. Had it not been for the constitution of the association which forbade his re-election, there is not the least doubt that he would have succeeded himself as the head of the Inter-State Association.

Mr. E. M. Coleman, the secretary of the association, has the respect and confidence of every manufacturer and every operating company represented in the convention. He gave unstintedly of his time to make the association what it is to-day—the greatest telephone organization in the world.

As has been pointed out by the AMERICAN TELEPHONE JOURNAL, the Inter-State Telephone Association is the guiding spirit to-day

of the Independent movement. Every man engaged in Independent telephony looks to it for advice and help. It has demonstrated to the financial world that the credit of the Independent movement is as solid as a rock, and that the integrity of the men engaged in it is unimpeachable.

THE VALUE OF CONVENTIONS.

TO our mind the principal value to be derived from conventions is the exchange of experience made by those actually engaged in a given line of work which enables the best experience of the few to become the common property and general guide of the many. In a broad and complicated business like telephony there are many problems, great and small, constantly cropping up in the path of the manager and of the engineer. Some are solved in one way and some in another, and some are not solved at all. The discussion of the graver and more far-reaching of these problems, and the history of the solutions found for the smaller ones, form the proper work of a convention, by which it can make its proceedings the most valuable to all concerned. A convention that should meet with a definite programme of practical papers and subjects for discussion, and rigorously confine itself to those practical papers and subjects, could not fail to be of benefit to all concerned.

The danger that besets many conventions, and signs have not been wanting that telephone conventions are not to be exempt, is that of allowing the proceedings to degenerate into personal squabbles and struggles, which occasion much waste of time are of interest to none but the immediate participants and result in the blocking of real business. The avoidance of this style of discussion is one of the most important duties of the organizers and officers of a convention. The suppression of bickering, of politics and of personal matters imposes itself not merely because the introduction of such matters largely destroys the value of the convention to those most interested in its practical work, but also because a quarrelsome convention is a most unedifying spectacle for the general public to behold. A convention which departs from its serious work to indulge in politics and personalities gives the business with which it is connected a very poor advertisement with the general public. The esteem and good will of the public are most necessary to have on the side of the telephone business, and any action which tends to alienate them is an injury to the business at large.

There are numerous broad and interesting questions affecting the whole business which will well bear extensive and detailed discussion. Rates for large and small exchanges and for different classes of service; toll rates for suburban and long distance service; the distribution of toll receipts between inter-connecting companies; the management of traffic; the equipment of small exchanges—it would be easy to catalogue a score of important subjects on which an exhaustive discussion that should bring out the experience of those who have worked, and the suggestions of those who have thought, would be of the greatest value to all connected with the industry. Past telephone conventions have given us perhaps a little too much pioneer history and generalities and rather too little of practical suggestion and discussion relating to the real problems of the business. Experience in coping with these real problems is being acquired at a rapid pace and to make that experience available to all of those interested in the subject is the best work that a convention can do.



BANQUET TO THE INTER-STATE TELEPHONE ASSOCIATION, AUDITORIUM HOTEL, CHICAGO.

PROCEEDINGS OF THE INTER-STATE CONVENTION

INDEPENDENT telephone representatives from nine states have met and proved to the world their strength and their financial integrity. The second convention of the Inter-State Independent Telephone Association demonstrated to the investing world that capital is a sure winning card when used to create lines for telephones controlled by companies who oppose the Bell concern.

The convention just closed at the Auditorium Hotel in Chicago, was the most gigantic thing of its kind ever held in this country. The States of Ohio, Iowa, Wisconsin, Minnesota, Michigan, Indiana, Illinois, Missouri and Kentucky were represented by more than 3,000 Independent exchanges and fully 800 delegates, while they represented an investment of \$100,000,000 in Independent telephone systems which are paying a handsome profit.

Nowhere else on earth could a more intelligent or prosperous looking body of men have been gathered together. They represented the grit, the strength, the enterprise, the go-ahead spirit of the great and growing West, which, when opposed, only makes its spirit more determined as a greater incentive to success. The spirit that has built up these states is building up a system of telephonic communication that will encompass the entire nation.

The convention was a revelation to both Eastern and Western capitalists. The facts and figures presented opened their eyes, but in no greater part than by the intelligence and ability, in which these vast Independent telephone interests were represented by the delegates.

CONVENTION GETS TO WORK.

On Tuesday, December 9, the convention first gathered for the second annual meeting.

There were no hurrahs, but there were hurrys and scurryings by the exhibiting manufacturers to get their quarters into ship-shape in time. All manner of devices for advertising were circulated by them among the delegates and many of the souvenirs given away were unique and artistic.

The first business session was called to order in the banquet room of the hotel shortly after 2 o'clock. This beautiful room was brilliantly lighted and Redfield's full orchestra enlivened the proceedings with its operatic and rag-time strains.

James E. Keelyn, of Chicago, opened the proceedings by introducing the Hon. Lawrence E. McGann, comptroller of the city of Chicago, who, in the absence of Mayor Harrison, welcomed the visitors to Chicago. Mr. McGann expressed the regrets of the Mayor upon his inability to be present and hoped that fruitful and good results would come of the deliberations of the convention. It could not help but be so, he said, because of the intelligent, aggressive men who were there to deliberate.

The calculating, money-making farmer, said he, as well as the city man, had awakened and had a quickening of the nerves. As his profits grow greater the farmer appreciates more fully the value of time and the saving of steps.

In their avarice, the great capitalists, who control the public utilities corporations, have imposed upon the liberality of the people. They have become satiated with their great wealth and are demanding greater profits on their investments. Their policy is short-sighted. The mistaken generosity of the people has intoxicated the men of means who no longer will invest for fair returns. They want enormous profits.

He knew the men gathered together were there for the betterment of humanity by saving the wear and tear of nerves. He wished them the greatest possible success and hoped they would be well paid for their efforts. He hoped their stay in Chicago would be pleasurable, and he extended to them, in the name of the people of Chicago, a hearty welcome.

THE PRESIDENT'S ADDRESS.

President H. C. Raney, of Fairfield, Ia., arose in reply and said in part:

"On behalf of the Independent Telephone men of nine of the greatest states in the Union, I most heartily thank you for the generous welcome extended to this convention.

"It is indeed an honor to receive such a welcome to this, one of the greatest cities in the world, probably the greatest, when age and all other circumstances and conditions are taken into the

account. And we are doubly honored that that welcome is extended to us in such eloquent and appropriate language with such cordiality of expression by the honorable representative of this great city. The honor of a welcome to such a city is only equaled by the most honorable way in which it is extended to us.

"For that welcome we return our most sincere thanks. And yet, I think, that without egotism or undue exaltation, we may say, that such a welcome is not unworthily bestowed.

"We are here as the representatives of a business interest, which, in the nine states represented in this convention, represent an investment of at least one hundred millions of dollars. We represent the customers of business interests in your city, which employ ten million dollars of capital, furnish labor to fifteen thousand of your citizens and which do an annual business of twenty million dollars.

"And I submit to you, whether or not, as a business proposition, we are not worthy of such a welcome as we have received?

"But we are entitled to credit, not only as customers of great business interests in your city, but also for the work we are doing among the people of the states we represent.

"Ten years ago the telephone business was in the hands of a gigantic and grasping monopoly, and the blessing and convenience of its use was limited to the favored few. To-day, as the result of our efforts to give to the common people the benefits of the inventive genius and business push of your citizens, the telephone is an article of household use, almost as universal as the table and the stove, and almost as essential to the family welfare.

"We can lay just claim to the title of Benefactors of the Human Race. And as such, are we not worthy of your most generous welcome? for which again I thank you."

President Raney then addressed the convention as follows:

"It is an honor and a pleasure to me to now call to order the Inter-State Independent Telephone Association, and to address its members at this its second meeting. I wish to congratulate you, that you meet with such happy surroundings and under such favorable circumstances and that you have received such a generous welcome to this great pushing city.

"The energy and push of the Independent telephone man is proverbial, and yet I may express a hope that that energy and push may receive a new impetus by our coming in contact with the business life of this great city, and especially as we come into personal contact with our royal entertainers, who stand in the very front of the great army of live, hustling, business men in this city.

"I wish, that at the very opening of this convention, every member could fully understand and appreciate the importance of this meeting and fully realize what influence for good or evil to our business, and the business of those we represent, will emanate from this convention.

"The Independent telephone business in all its branches is a comparatively new factor in the great business life of this country and of the world. But it has advanced rapidly to a prominent place in that business life. It needs no prophetic eye to realize the immense possibilities of the business in the near future. What I have already said of its growth in the past is but an index of the future.

"Realizing these things myself, and asking of every one in attendance here, his careful consideration, I ask, that the matters coming before us be so taken up and handled as to bring the highest degree of credit to ourselves and the greatest good to our business. May our deliberations be worthy of the business we represent.

"The work this convention has to do in the first instance is directly with telephone business from the operators' standpoint, in immediate results from a financial standpoint it may more directly effect the business of the manufacturers and supply men.

"But if they have special opportunities to induce us to do business, and get our money, we will at least have the opportunity of knowing what is on the market, and finding out what is most adapted to our wants, and where we can get it the cheapest.

"The active work of the convention readily divides itself into three parts or heads: First: Our business relations with

the general public; second, our business relations with each other, and third, our business relations with and standing in the financial world.

"As to our relations to the general public we must remember that we are of the people, that our business had its origin in the needs of the people and in their attempts to supply these needs. It is for this reason that the Independent telephone movement has always had the moral as well as the financial support of the mass of the people. In this fact we find the secret of past success and the guaranty of future greatness.

"It is therefore of the utmost importance that we preserve intact the cordial relations heretofore existing between the people and the Independent telephone movement.

"This means, that in fixing and regulating rates of rental and toll service, a proper regard is shown to the people's side of the question. But more essential yet than this, is a course of action on our part, having in view the proper treatment of our patrons, so as to retain their good will and interest in our success.

"The inducements which the business has offered in the way of returns on investments, and the opportunities for acquiring rights and privileges having a great future value such as franchises and rights of occupancy in highways, have aroused in some men a spirit of avarice and greed for territory, that has led to serious complications, which, unless speedily settled, will work untold injury. In other cases there seems to be a disposition to exact harsh terms for privileges granted, and a general tendency to want to do business on the 'Keep all you can get' plan.

"There is room for all and we must respect each other's territorial rights. In granting privileges and concessions we must not lose sight of benefits received; and should make our grants on an equitable basis. If it is the good fortune of some company to control the business in some important center, just as equitable arrangements should be made with other companies, asking admittance to such center. We should do all in our power to enhance the value of each other's property, instead of attempting to destroy that value by demanding unfair connecting contracts.

"Each company is entitled to receive the pay for the service which it renders, either in use of line or operator's services.

"The time has certainly come when improved business methods are demanded among telephone operators. No company should be asked to furnish service without just compensation. Neither should one company receive the compensation for the service which some other company has rendered.

"I would urge very emphatically a more careful consideration of our duties and obligations to each other.

"We must look carefully to our relations to the financial world. In the earlier history of the Independent telephone movement the financial question was not a serious one. As a rule the local company could find abundant local capital for all its wants. A comparatively small amount was required to start an exchange in the town or village.

"But the almost universal experience of the small company has been, that in order to protect the investment already made it must extend its service to adjoining towns and frequently over a county in the way of a toll service. In most instances this has been followed by the necessity of building farmer lines. So in many instances the financial question has become a serious one, even to the small companies; and when it comes to attempting to occupy the larger cities and build long distance lines the difficulty has increased.

"Independent telephone stocks and bonds have in the past had no established standing financially. Our special enemy, the Bell Company has been very active in its efforts to injure us along this line. They have talked 'natural monopoly,' and 'infringement suits,' and other scary things until men with money hesitated. They have followed this with misrepresentation and misstatement of actual conditions.

"The actual financial history of the Independent Telephone Movement is a matter of wonder. As we all know, the men, who have engaged in the business, started without any experience whatever. They had everything to learn. They made many costly mistakes. The results financially are summed up by a writer in the *Saturday Evening Post*, as follows:

"Independent companies are springing up over night, and almost without exception they are successful from the very start. It is of record that there were more failures of national banks last year, than of Independent telephone companies for the last three years. Yet a dozen telephone companies are organized where one national bank is organized. And we have always been

accustomed to look on a national bank as the soundest institution in the country."

"Notwithstanding the efforts of our enemies, our business has already attained to a most enviable financial standing. Our future in this regard is in our own hands. A careful, conservative course, directed by our past experience, will put us on a firm financial foundation."

SECRETARY READS HIS REPORT.

E. M. Coleman, of Louisville, Ky., secretary of the association, next read his report, which showed the tremendous amount of work necessary to bring the organization to its present wonderfully strong status. During the year 22,500 pieces of literature had been circulated. He suggested that the convention decide upon the eligibility as to membership of those who use the Bell receivers and transmitters. He predicted that the good to be accomplished by this association would exceed anything that had been anticipated by its originators.

The secretary paid a compliment to the AMERICAN TELEPHONE JOURNAL, and said that its aid and advice helped materially in bringing the association to its present success.

The following nominating committee was named to select officers for the coming year:

Ohio, W. Guy Jones, Columbus; Iowa, Dr. H. S. Herr, Ottumwa; Wisconsin, W. T. Goodrich, La Crosse; Michigan, William Robertson, Muskegon; Indiana, L. A. Frazee, Connersville; Illinois, E. C. Hull, Salem; Kentucky, H. K. Cole, Owensboro, and Missouri, W. F. Hall, Clinton.

Mr. Wheeler, on behalf of the tunnel builders, invited the convention to take a trip through the 12 miles of telephone tunnels under Chicago, already built. The convention accepted the invitation for Wednesday afternoon at 4.30 o'clock.

EXCLUDING "BELL USERS."

B. F. Cockran, of Clinton, Ill., moved that no person using Bell receiver and transmitter be eligible to membership in the association.

The motion caused a wide range of discussion. Mr. Cockran said the Bell company could not make them use its telephones and exact \$5 a year for each, but now tried to compel them to use the transmitter and receiver at \$1.75 each. But when it came to the use of the switchboard he thought it was something different. This should not be prevented.

Mr. Ware said that these conditions were new to him. Suppose we make connection with Bell switchboards under a contract, said he. What then?

Mr. Cockran replied that his company was in a position where it connects with the Bell. "They use our booth, but we have no contract. We pay them and they pay us."

Mr. Cockrell said he did not believe in admitting any body who was doing business with the Bell company. Such a company was not Independent. No one having a contract with the Bell people should be allowed to become a member of the association.

Mr. Seeley of Ashland, Ky., said: "If this goes through we can't be admitted. We have got to do business with the Bell people over long distance lines as they will get a local franchise. They are perfectly willing to do business with us."

Mr. Morrison, Bryan, Ohio, said: "We have been up against this proposition? When you connect with the Bell lines you destroy the possibility of constructing or maintaining Independent lines. I don't think it is an advisable thing to do."

Mr. Layne, Missouri, said the question had widened itself from the original stipulation. First it was only a question of receivers and transmitters, then it turned to other matters. He thought the matter should be left to a committee of one from each state represented in the convention. It was decided that the report of the committee on this question should be the first business taken up at the Wednesday afternoon session.

THERE ARE BELL INTRUDERS.

The secretary called attention to the fact that there were a number of Bell men present. He wanted to know whether these invaders would be allowed to remain or be excluded. This created quite a sensation, and was followed by considerable discussion.

Mr. Savage, of Champaign, Ill., said this was a meeting of Independent telephone men for business. He agreed with the sentiments of the secretary and thought it was carrying courtesy too far to admit any to the convention except Independent telephone representatives.

A committee of nine to consider the question was named as follows: Ohio, H. H. Robinson; Iowa, J. S. Bellamy; Wisconsin, W. J. Bell; Minnesota, W. J. Buck; Michigan, J. B. Ware; Indiana, L. A. Frazee; Illinois, M. Savage; Missouri, J. W. Layne; Kentucky, A. L. Têtu.

The convention then adjourned until Wednesday afternoon at 1 o'clock, the committees meeting in the evening.

SECOND DAY'S SESSION.

Wednesday afternoon's session was called to order shortly after one o'clock.

J. B. Ware from the special committee on membership read the reports of the committee, one upon the eligibility of membership and the other upon manufacturers who sell to competing telephone companies in the same localities, which was adopted, and is as follows:

"Resolved, That this association pledge its members to refuse to patronize manufacturers who sell apparatus to any Independent company entering into competition with any other Independent telephone company already established and giving reasonably efficient service."

REPORT ON MEMBERSHIP.

The report on eligibility of membership set forth:

"The success of the Independent movement, thus far, has depended upon, and been made possible, by the union of action and the hearty and loyal co-operation, on the part of the opposition companies, in the interchanging of telephone business and in the use of apparatus made by Independent manufacturers.

"The patronizing of these manufacturing institutions, competing with each other, has resulted in great improvement of telephone apparatus, in very largely reducing the cost of the same and in securing to the public such improvement in quality of service and in the lowering of rates as to lead to an increase in the number of telephones in use that can scarcely be comprehended.

"To-day telephones, switchboards and other apparatus can be purchased in the open market, without royalties, and unexcelled and often unequaled in quality and in service results. It is conceded by all acquainted with the telephone development during the past five years, both Independent and Bell, that except for the patronage given Independent manufacturers, these improvements in apparatus and in service to telephone users and the increase in the number of instruments used would have been impossible.

"Therefore, we deem it for the best interests of the public and Independent companies that the competing manufacturing institutions continue to be patronized, and that any operating company or individual using Bell apparatus does that which tends to demoralize and destroy the Independent movement, and that such parties should not be admitted to membership in the National, Inter-State or State associations.

"We believe further that future success also depends on those who have invested, or who may hereafter invest, in Independent exchanges or lines being insured proper connection with all other Independent exchanges and toll lines in the territory covered.

ELIGIBILITY OF MEMBERS.

"We therefore recommend that, on the operating side, only such individuals and companies who, under proper contract relation and in good faith, connect their toll lines and exchanges with other legitimate Independent companies, where opportunity offers, shall be eligible to membership in this Association.

"Further, we deplore individuals or companies connecting lines or exchanges with Bell licensee companies, as has been done in a few instances, in different States, as we believe that no such relation should be permitted, except possibly in isolated cases, which arrangement should be passed upon and authorized by the State Association, if there is one, and by the Executive Committee of the Inter-State Association, or the Advisory Board of the National Association, the authority in each case to be granted only by two-thirds vote of such State association, committee and board.

"In conclusion, we urge this Association, at this, its second annual meeting, to adopt this report as indicating in part our willingness and determination to do that which it is believed will secure the best results, time considered, to the public and to the investor. 'In union there is strength' is particularly true of our telephone business."

This resolution provoked considerable discussion, but was finally unanimously adopted.

George N. Bandy of Perry, Ia., read an instructive paper on "Rates—Measured Service," which is printed on another page.

Dr. H. D. Herr, of Ottumwa, Ia., presented a paper on "Sliding Scale Rates for Exchanges," which was read by his daughter in a very clear voice. The paper is printed on another page.

Mr. Hall moved a vote of thanks to Miss Herr for the able manner in which she read her father's paper, which was passed.

Mr. Glandon, of Pike County, Ill., said he had adopted the sliding scale, and it was proving very satisfactory, as it increased the number of subscribers.

"Toll Rates," was the title of a paper read by H. H. Robin-

son, of Cleveland, Ohio, who gave a historical review of their origin by the American Bell Telephone Company. This paper is published in this issue, and will be found on another page.

The paper was a remarkably able one, and elicited wrapt attention. It showed a thorough investigation and knowledge of the subject.

ST. LOUIS IS HEARD FROM.

Mr. W. E. Goldsborough, chief of the department of electricity, of the St. Louis World's Fair, was given five minutes to talk about the coming exposition and its proposed electrical exhibit. He invited the association to hold its 1904 convention in St. Louis.

Mr. Layne, of Missouri, offered a resolution fixing St. Louis as the place for holding the 1904 convention, the date to be fixed by the executive committee and endorsing the coming St. Louis World's Fair. It was referred to a special committee to report Thursday morning. Messrs. Pruett, of Kentucky, and Layne, of Missouri, were appointed as the committee.

Restrictions by municipal authority and synopsis of the law were discussed by Messrs. W. F. Laubach, of Akron, O.; E. W. Pickhardt, of Huntingburg, Ind.; M. Savage, of Champaign, Ill., and J. B. Ware, of Detroit, Mich., in very able papers, which are abstracted in this number.

Messrs. Frazee, Valentine and Dobie were appointed the auditing committee by the chair.

Mr. Hutchinson, of Wisconsin, moved that the chair appoint a committee of five to fix a schedule of uniform toll rates to report on Thursday morning. The chair appointed Messrs. Hutchinson, Robinson, Presson, Rex and Layne as the committee. The convention then adjourned to view the telephone tunnels now under construction in Chicago.

LAST DAY'S SESSION.

Thursday was the closing day of the convention and the morning session was called to order by President Raney at 10 o'clock. The special committee on holding the convention of 1904 in St. Louis during the World's Fair in November, made a report through John W. Layne, recommending that the convention be held there, and that the constitution be so amended as to permit the change. The report was concurred in.

The auditing committee made a report showing that there was a balance of \$290 in the secretary's hands. The report was received and the committee discharged.

Mr. Hall, of Missouri, thought there should be a committee on toll construction and other lines in city and country and on sale of supplies to farmers, when the manufacturer should sell to the adjoining exchange instead. Objectionable people should not be sold to. The supply dealer and Independent exchanges should be protected alike. The president then called Mr. Rex, of Indiana, to the chair.

"Settlement of Toll Business Between Connecting Companies," was the subject of a paper read by A. L. Hutchinson, of Weyauwega, Wis., which will be found on another page.

FIXING TOLL RATES.

Mr. Hutchinson from the committee of five reported the following resolution on toll rates:

"Resolved, That the Executive Committee of the Inter-State Independent Telephone Association, acting in conjunction with the secretary thereof, arrange a schedule of toll rates for connecting companies and basis for division of fees and submit the same to the several State and district associations within the Inter-State territory, with a request that the same be adopted and put in force by the members of such State and district associations, and, be it further

"Resolved, That in the absence of such adoption of such rates and in absence of any express tariff agreement between connecting companies, that the fees to be charged and basis for division thereof shall be based upon the schedule and basis recommended by the Executive Committee of this Association, and, be it further

"Resolved, That all Independent companies operating within the Inter-State territory be apprised of such schedule and basis for division of fees as soon as the same has been determined by the Executive Committee of the Association."

The resolution was adopted after a brief discussion.

H. E. Ralston, of Maitland, Mo., was not present to read his paper, "Enforcement of Message Time Limit," but it will be printed in the record.

INDEPENDENT SECURITIES.

"Independent Telephone Securities as an Investment, From a Banker's Standpoint," was an able paper read by Col. J. D. Pow-

ers, president of the National Trust Company, of Louisville, Ky. It is printed in this issue.

Dr. Herr moved that the paper be published in pamphlet form for the information of the world at large. The motion prevailed.

On motion of Mr. Layne, Col. Powers was accorded a rising vote of thanks.

J. W. Layne, of Carthage, Mo., discussed telephone securities from the small investor's standpoint, which will be found on another page.

Mr. Layne was also accorded a rising vote of thanks on motion of Dr. Herr.

"The Berliner Patent, Bell's Claim of Infringement and Litigation now Pending," was the title of an exhaustive paper read by J. J. Nate, of Chicago. It was an able historical document clearly covering the ground, and is abstracted in this number.

Mr. Dobie, Iowa, offered a resolution to the effect that no member of the association patronize the Western Electric Company, which is owned by the Bell Telephone Company, which was adopted.

The paper of Senator C. E. Hull, of Salem, Ill., was not read at his own request, but will be printed. It is entitled "Suggested

Methods of Improving Long Distance Telephony."

Resolutions of thanks were passed by the association to the manufacturers of electrical goods and electrical supply houses for the magnificent entertainment given by them and for their generous efforts to make the stay in Chicago pleasant and profitable; also the readers of papers, the Illinois Telephone and Telegraph Company, the officers, and the representatives of the St. Louis Exposition.

Richard B. Watrons, secretary of the Business Men's League of Milwaukee, Wis., invited the convention to hold its next annual session in that city. The matter was left to the officers of the association and the executive committee to decide.

The following officers were elected for the ensuing year:

President, C. E. Hull, Salem, Ill.; vice-president, L. A. Frazee, Connersville, Ind.; secretary, E. M. Coleman, Louisville, Ky.; treasurer, J. W. Layne, Carthage, Mo.

Executive Committee:—Iowa, Dr. H. S. Herr, Ottumwa; Ohio, W. Guy Jones, Columbus; Wisconsin, A. L. Hutchinson, Weyauwega; Minnesota, E. H. Moulton, Minneapolis; Indiana, O. Rex, Indianapolis; Illinois, A. B. Conklin, Aurora; Missouri, W. F. Hall, Clinton; Kentucky, David Pruett, Winchester.

The convention then adjourned.

CHICAGO MANUFACTURERS' BANQUET

The banquet which wound up the convention of the Inter-State Independent Telephone Association was more than "a feast of reason and flow of soul." It was a veritable season of harmony and good feeling and cemented bonds of fealty that will prove a chain of strength in the future for the organization.

There were nearly 700 ladies and gentlemen at the tables, which were set in the large dining hall of the Auditorium Hotel on the ninth floor. Roses in vases and ferns were the table decorations.

The toastmaster was H. C. Raney, of Fairfield, Ia., the retiring president, and he made a most efficient presiding officer.

KEELYN WELCOMES GUESTS.

James A. Keelyn, chairman of the supply manufacturers, dealers and their allied interests as an association, was the first speaker. He made a well worded welcoming address, which was frequently interspersed by evidences of appreciation by the audience. He said more trade was diverted from Chicago by the monopoly of the Bell company of the telephone business than the business men of Chicago could possibly appreciate.

H. C. Raney then took the gavel and in a happy vein introduced Frank G. Jones, of the American Electric Fuse Company, to respond to the toast "Harmony."

He commenced by saying "Ladies, Gentlemen and fellow sinners," which brought down the house. The word "Harmony," he said, was a new one in the telephone business, but they had gotten together with a feeling of good fellowship, and he extended the right and left hand and the brains in this cheerful communion of saints and sinners. The world was coming to them and the Independent telephone lines would grow, prosper and extend to the ends of the earth.

Charles B. Cheadle, of Joliet, Ill., spoke on telephone securities and the great state of Illinois. He said that these reunions cemented the brotherly feeling and era of good fellowship. Heretofore the Independent companies had difficulty in obtaining capital to carry on their enterprises, but now ample capital was obtainable everywhere for the construction of Independent lines. Heretofore the Independent telephone man had underestimated his own importance. No Independent telephone man who was self respecting would enter into any agreement with the Bell company.

Mr. Savage, of Champaign, Ill., responded as an annex to Mr. Cheadle with two verses of original poetry.

JOURNAL IS HONORED.

W. H. McDonough, editor of the AMERICAN TELEPHONE JOURNAL, was introduced and in behalf of the telephone press, said: "Chief Operator Raney should not have rung me up inasmuch as I have to talk 52 times a year and might be exceeding the time limit."

"What is it that has brought us all to this city. It is to discuss

the future of the Independent telephone industry. To my mind the Independent business is one of the great industries of the present century. Still we find a few, and, some of them in our own ranks, who tell us that we are rapidly approaching the limit of our endeavors. If these pessimists would study the past of the telephone and analyze the figures of population, etc., how soon their eyes would be opened. When the Independents entered the field, the Bell company had about 275,000 telephones in the whole of the United States. That is but seven years ago. To day there are over three and a half millions in round figures.

"Of this number the Bell had on the 20th of last month, according to their published statement, 1,549,673, leaving about 2,000,000 in the hands of the Independents. According to the United States census of 1900 there are in this country 5,739,657 farms, every one of which needs a telephone. So if we were to place all the telephones in this country both Bell and Independent, on farms, there would still be over 2,000,000 farms without an instrument and not a single one in a town or city. This shows what can be done in one department of our business.

"Then, again, take the possibilities of the telephone development in the railroads of this country. At this moment there are hundreds of thousands of clicking telegraph instruments in use, sooner or later all these must pass away to give place to the telephone. Let me predict here that the telephone will be alive when the telegraph is but a memory. When the Independent telephone business shall have reached its twenty-first birthday I believe you will find the telephone in every farm house, in every city home, in every room of a hotel, on every desk in an office, on the bench of the factory, in the berth of a steamship, in fact the telephone will be ever present. This will mean 15,000,000 telephones. Can any one now talk anything but prosperity for our business."

RELATIONS OF SUPPLY MEN.

The business supply men and the relation of the supply man to the Independent movement, was responded to by J. A. Bennett of the Electric Appliance Company. He said that the general feeling was in all the supply houses that they belonged to the Independent Telephone Association.

Col. J. B. Powers, of Louisville, responded to the State of Kentucky, in a well chosen, witty speech, full of stories that were exquisitely told, and which created no end of laughter.

Out of Town Telephone Managers was responded to by Judge McHugh, of Lafayette, Ind., in a most happy vein. He paid a tribute to the manufacturers and Independent associations throughout the country in their contest for business but in their contest against the Bell monopoly they stood as one.

Early Reminiscences of the Telephone Work was dilated upon by J. J. Nate of the Stromberg-Carlson Company, in a most happy vein and with a fund of funny stories that created laughter and applause.

J. W. Layne, of Carthage, "Expatriated on Young Missouri," in a masterly way.

"Poles, Straight, Live Fields," was the subject to which E. A. Lindsley, of Lindsley Brothers' Company, of Chicago, responded. He said that the Independent telephone movement had really proven the birth of the pole business, giving it a new impetus, and made them feel that they were really pole men.

"The Lawyer in the Telephone Business," was ably handled by F. W. Pringle, of the Western Telephone Manufacturing Company. He said all the trouble from the Bell patents were really mythical and without any real foundation.

H. H. Robinson, of Cleveland, spoke for "Ohio, and the Wonderful Growth of the Independent Telephone Movement in that State."

Col. Thomas Persima, of Milwaukee, spoke for Wisconsin in a humorous and witty way, and gave a telling talk.

Frank L. Perry, of the *Western Electrician*, spoke for the ladies.

After some brief informal talks by others the feast of reason ended and the second annual Inter-State Independent Telephone Convention came to a happy close at an early hour on Friday morning.

EXHIBITORS AT CHICAGO

There has never been a telephone men's convention where there was such an extensive line of exhibits by the manufacturers as was shown at the Interstate Independent Telephone Association gathering in Chicago.

More than two great floors of the Auditorium Hotel were the scene of the excellent show, and it is doubtful if the great world's fair at St. Louis in 1904 will make a better general total exhibit. Every conceivable thing that goes to make telephony a success up to date was on view. All did a large business.

In room 614 the Kellogg Switchboard and Supply Company exploited their wares, and were represented by R. H. Manson, A. E. Barker, R. S. Mueller and W. J. Gunn, who made all visitors welcome.

In room 616 the Electrode Manufacturing Company, of Brooklyn, N. Y., was represented by Joseph Steinberger, vice-president and H. E. Cobb, of Chicago. This company makes a substitute for hard rubber in all things of that character that go into telephone construction and their products are recognized all over the world. The exhibition was one of the most unique at the convention and the souvenir was one of the most valuable given away, consisting of a desk set, with a cut glass inkwell on a base of electrode.

In room 618 the Maltby Lumber Company, of Bay City, Mich., represented by A. Maltby and I. A. Maltby, had an exhibit of poles.

In room 626 the Nungesser Electric Battery Company, of Cleveland, showed a full line of its goods, being represented by Thomas G. Grier, of Chicago.

The Calculagraph Company, of New York, was encamped in room 628, where Henry Abbott, W. C. Garrison and P. C. Wilson expatiated upon the virtues of the timepiece that keeps accurate tab on long distance telephone users.

Looking into room 632 one saw the exhibit of the F. Bissell Company, of Toledo, O., which showed a new thing in an illuminated Independent telephone sign which is very attractive. The representatives were F. Bissell, C. M. Hamilton, W. S. Bissell and M. S. Walker.

A glance into room 636 showed the exhibit of the International Telephone Manufacturing Company, of Chicago, which was represented by W. E. McCormick, John C. Burmeister, its secretary; Henry Shafer, president; R. N. Stiles and D. A. Clithero. The switchboard for the new Claypole Hotel, St. Louis, was on exhibition in the rotunda. They also had a 400 line central energy lamp signal switchboard in room 638, as well as a power switchboard for the East Aurora (N. Y.) exchange; a section of the distributing board of 12,000 line capacity for the Detroit, Mich., exchange, and the power for a 2,400 line board for Bloomington, Ill.

Carney Brothers' Company were located in room 546, where they were represented by E. E. Kaufman, W. J. Carney and D. J. Carney.

The North Electric Company looked forth from rooms 601 and 602 with a creditable and attractive exhibit. F. F. Sapp, George B. Pratt, L. G. Bowman, H. L. Light and J. F. Davis, represented the corporation. Handsome souvenirs in the shape of rabbit's feet, gold plated receivers, pins for the ladies, and other nicknacks were a feature for the visiting delegates and their friends.

The Sterling Electric Company extended its hospitality from rooms 604 and 606, through W. E. Doolittle, H. A. Taylor, S. B. Fowler, F. E. Rotchka, H. F. Doolittle, Evan Shelby, E. M. Johnson, J. W. Metcalf and Ethel Henderson. This company had a full exhibit of telephone apparatus, including transfer and magneto switchboards, as well as operating devices and instruments. Its souvenirs were handsome miniature transmitters and receivers, in gold and hard rubber.

In 608 was the Miller Anchor Company, of Norwalk, Ohio, represented by G. H. Miller.

R. L. McQuat, of Indianapolis, Ind., was in room 777, where O. M. Corman acted as representative.

The Standard Underground Cable Company was well represented by P. H. W. Smith, of the Pittsburg office, A. A. Anderson, Pittsburg; J. R. Wiley, E. J. Pietzcker and W. M. Rogers, Chicago. They had a handsome exhibit of samples of cables and several coils of copper wire showing the product of their new copper wire mill at Perth Amboy, N. J.

Quietly ensconced in room 638 was the Central Telephone and Electric Company, of St. Louis and Chicago, with a display of switchboards, telephone supplies, and a nice display of the Becker terminal head. The representatives were James S. Cumming, C. H. Wallis and H. J. Joys.

The National Autophone Company, of Chicago, had room 637, and showed their fire alarm and autophone boxes for police lines. E. E. Salisbury and Frank Hochlassen were the representatives.

Cable reels, etc., made by W. H. Anderson & Sons, of Detroit, Mich., were shown in room 640, W. R. Anderson, secretary and treasurer, was the representative.

Wheeling, West Virginia, was represented in room 639 by the Mountain Electric Company, who had F. B. Hall and A. F. Poole to tell all about telephone apparatus and terminal boxes.

The Chicago Telephone Supply Company, of Elkhart, Ind., occupied room 642, where George A. Briggs, S. A. Duval and L. G. Le Bourveau acted as representatives. This company has just perfected and placed on the market a fine transmitter for central energy apparatus for the small farmers' exchanges.

In room 647 was the Gordon Battery Company, of New York, with a fine display, represented by E. M. Deems, Chicago.

The W. G. Nagel Electric Company, of Toledo, O., had room 652, and was represented by H. E. Adams.

Coming into room 654 the Western Telephone Manufacturing Company, with its plant at Winthrop Harbor, Ill., was found at home. Its representatives were James E. Keelyn, general sales manager; H. S. Pringle, superintendent; W. G. Peacock, engineer, and Charles Sanders, salesman.

Visitors found the Eureka Electric Company, of Chicago, at home in room 656, where David L. Canman, H. J. Kusel, Herbert Rosenow, Charles Canman, Lewis Kyle, C. W. Robbins, Harry Currier and I. J. Kusel acted as representatives.

The Holtzer-Cabot Electric Company, of Boston, Mass., made its headquarters in room 658 with a creditable exhibit, and was represented by C. A. Holtzer, president; E. R. Harding, Western manager, and A. E. Klunder, F. R. Hodson and Thomas Meinema.

If you were looking for the Standard Pole and Tie Company, of New York, you found them in room 660, where Fred. L. Merritt, the secretary and treasurer, assisted by W. E. Mitchell, officiated. They showed sections of white cedar or juniper poles and Florida heart pine cross-arms. They gave away a small souvenir in the shape of an octagonal penholder, an exact facsimile of their octagonal shaped poles.

The New Haven Novelty Manufacturing Company, of New Haven, Conn., had its doors open in room 662, where H. Grant Thompson, the president and Charles Luke, the superintendent officiated.

Hubbard & Co., of Pittsburg, were at home in room 736, where C. Seyler showed the new fire alarm bracket and the non-breakable messenger hanger.

The Dearborn Electric Company, of Chicago, welcomed its friends to room 714.

In room 710 the Wittenberg Cedar Company had an exhibit of its products.

In room 540 the American Steel and Wire Company was represented by A. J. Hess, C. S. Knight, B. B. Ayers and Norton H. Van Sicklen.

The E. E. Naugle Tie Company, of Chicago, had headquarters in room 126, where A. T. Naugle made all visitors at home.

In the South parlor the American Electric Fuse Company had its exhibit. The representatives were Frank G. Jones, president; J. A. Kenny, general manager, and C. A. Rolfe.

One of the prettiest and most complete exhibits in the south parlor was that of the Swedish-American Telephone Company, which gave away carnations and miniature receivers as souvenirs. One of the features of the exhibit were the ornate and tasty signs. The representatives were E. B. Overshiner, C. H. Macklin and A. V. Overshiner.

The Illinois Electric Specialty Company also had its exhibit in the south parlor. It was very creditable. Its souvenirs were handsome illuminated cigar trays. One of its specialties, a picture of a pretty girl, puzzled all visitors. The representatives were F. B. Patten, president; H. O. Rugh, Robert Mitten, John Lyman.

Telephony was represented by H. B. McMeal, Edward J. Mock and C. A. Kenworthy.

Raber & Watson, the pole men, were also located in the south parlor. They had a miniature exhibit of a railway with a trainload of poles and telephone lines stretched on poles, topped with nine flags representing the nine states represented at the convention. Their souvenir was a morocco bound perpetual calender for office desk.

Rooms 128 and 130 were headquarters for the American Electric Telephone Company. Here were: P. C. Burns, president; J. G. Ihmsen, general manager; representatives, S. J. Bear, John H. Reid, W. R. Hauptman, K. V. Murry, M. W. Zabel, O. M. Leich. The engineering department was represented by H. P. Clausen, A. H. Dyson, W. F. Gradolph, R. E. Pickrell. The souvenir here was a telephone screw driver. The rooms were luxurious, and a 12,000 line multiple switchboard was one of the most attractive exhibits.

The McRoy Clay Works, of Brazil, Ind., represented by Mr. Kirkpatrick, also had an exhibit.

Room 132 was occupied by the National Carbon Company, of Cleveland, O., which was represented by M. H. Moffett and A. V. Ward.

The Stromberg-Carlson Telephone Manufacturing Company had a most attractive exhibit on the parlor floor. Its souvenir was a paper weight to be sent to its friends who requested one. The representatives were William Bowen, R. B. Tyler, A. J. Rosseau, G. E. Knight, J. J. Nate, Paul D. Meyers, E. L. Brown, and Messrs. Pierce, Hewitt, Smith and Lewis, as well as the advertising manager, F. L. Martin.

Room 140 was headquarters for the Farr Telephone and Construction Supply Company, the representatives being E. W. Hurst, Charles W. Farr, John E. Bowen, N. B. Farr. The Chicago Pay Station Company was also represented here by J. Cecil Finch, manager, and G. H. Morgenstern, sales manager.

The H. B. Camp Company had room 142, where J. A. Hammett explained clay conduits. A beautiful descriptive book told the firm's story. Here, also was the John A. Roebing's Sons Company, of Chicago, with George C. Bailey, the secretary and treasurer; W. P. Bowman, manager at Cleveland, O., R. B. Abbott, H. C. Griffen, A. B. Conover, W. H. Slingluff.

Lindsley Brothers, of Chicago, with offices in The Tribune building exhibited their poles and polecat souvenirs. They were represented by G. L. Lindsley, president; C. P. Lindsley, Spokane, Wash., vice-president, and E. A. Lindsley, secretary and treasurer.

Williams-Abbott Electric Company was found in room 762 with L. Sands and T. H. Lincoln as representatives.

In room 611 the Hipwell Manufacturing Company, of Allegheny, Pa., and Chicago, showed new and second hand reconstructed switchboards of standard makes, as well as other specialties. H. H. Hipwell and J. A. Russell were the representatives.

The Guarantee Telephone and Equipment Company, of 71 West Jackson boulevard, also occupied 611, and was represented by J. T. Ridgway.

The Standard Vitrified Conduit Company was ably represented by its secretary, Bleeker S. Barnard. He is perhaps the best known salesman of conduits in the country, and has never been known to miss any electrical convention.

The Electric Appliance Company, of Chicago, had a full exhibit of telephone batteries and general supplies in room 612. It was represented by W. W. Low, president; Thomas L. Stacey, secretary, and Samuel A. Dinsmore, manager of telephone department.

The Controller Company, of St. Louis, had a full line of its novel telephone coin controllers, and had as representative George Moselle.

In room 646 was the Valentine Clark Company exhibiting cedar poles, F. L. McGillan being the representative.

B. F. Vreeland, of Denver, Col., one of the largest dealers in poles in that section of the country attended his first convention.

The Veeder Manufacturing Company, of Hartford, Conn., exhibited its telephone counters. Its representatives were E. G. Biddle and T. H. Cranson.

The Yonkers Specialty Company, of Yonkers, N. Y., exhibited its Metropolitan Cable Clip and also a new patent ground clamp. It was represented by its president, F. B. Fuller.

DELEGATES TO THE INTER-STATE TELEPHONE CONVENTION, CHICAGO.



INDEPENDENT TELEPHONE SECURITIES AS AN INVESTMENT—FROM A BANKER'S STANDPOINT*

By COL. J. D. POWERS.

SECURITIES of any kind to be a good investment must be *secure*. The highest quality in any investment should be its soundness as a permanent quantity with an inherent ability to sustain its quality. From the banker's standpoint the acceptable security is that which represents real value and possesses that quality which enables it to grow stronger as it grows older, with its foundations broadening and deepening as the pressure of time settles it in its permanent abode. The weakest period of any security should be at its birth. Any weakening after it is launched shows a faulty foundation. Stocks and bonds are only representative in character, and if the source from whence they spring is not sound, safe and well grounded with a foundation sure and steadfast, all of the fine engraving, lithographing and tinting will not give them character nor furnish them a market.

The first prerequisite of a bond or stock issue which shall carry conviction of safety and security with it, is character and intelligence in the personnel of the corporation. The true foundation of the corporation is found in the individual members thereof. They impress upon the artificial persons the same character and standing that they enjoy as individuals. In the corporation, as in the stream, it will be pure if its source is pure, and foul if its source is impure. I take it that there can be no special class of securities that are either wholly good or entirely bad, but there is no doubt whatever that the general character of the business is some index to the desirability of the securities. At one period of our history that general security which is now the most popular ranked about like oil and mining shares do at the present time, but now we all appreciate that a dividend-paying railroad stock or an interest-paying railroad bond will buy money cheaper than anything else except Government bonds. The difference is not so much in the thing as in its management and control. Railroads are now operated on scientific business principles and their fiscal affairs are not left to mere chance. We are living in a different commercial and financial era from that of thirty or forty years ago, when colossal fortunes were made in destroying railroad securities and wrecking railroads, thus bankrupting the original owners, whose money provided the means for enriching the wreckers.

Each banker determines from his own viewpoint what is desirable or good for his bank as an investment, and the diversity of opinion as to the desirability of a new and untried security is very great. The Independent telephone movement was not primarily a well considered and fully digested financial venture, but rather the outcome of untoward conditions brought about by the arbitrary attitude of the Bell people toward the general public, thus making the original venture a sort of protest against inefficient service, high rates and general intolerance of the rights of the public, all of which was the outgrowth of the monopolistic policy inaugurated by the Boston syndicate, who controlled the talking machines of the country. Such tactics were pursued as to force the building of Independent exchanges, and when five or six years ago the movement began to attract attention locally, the most vindictive, malicious and unreasonable war was inaugurated to break down and destroy any and all semblance of competition. The war waged was so fierce, the methods adopted so vicious, that the Independents, in order to sustain themselves, were absolutely forced to inaugurate the very best possible construction and to install and maintain a system of the highest efficiency, which could be maintained at the minimum of expense, thus almost unconsciously laying the foundation for enlargement, as well as affording the basis for good, high-class securities, based not only upon earnings, but equipment. This is the answer to the inquiry, why have Independent exchanges been so well constructed, so thoroughly equipped and so splendidly operated? In estimating the value of the securities offered by the Independent telephone companies, it is of the utmost importance to examine into the question of location, surroundings, population, outside connections and inside influences and management.

Necessarily the Independent movement has been localized. A critical examination will show that nearly all the Independent exchanges of the country are under the control and under the management of home people. These people have ventured their time and money in an enterprise that protects their neighbors, as well as themselves, from the extortionate charges that they were forced to pay the monopoly, and the public understands that if it should withdraw its generous support from the Independents and cause them to fail, the loss would come much nearer home, in the restoration of the old "talking tariff."

So you may rest assured that the Independent telephone is a fixture. It has come to stay and the conditions behind its securities are permanent. The main question, then, is, have they the necessary earning power to promptly meet their interest and put aside enough into the sinking fund to pay their bonds at maturity? In dealing with this general question it is of the utmost importance that we reckon not from the profits of a single month, nor yet of a single year, but take the gross earnings of a given number of subscribers for a given period of time, as against the expenses and fixed charges, including interest on the bonds and the payments to the sinking fund, and see what the result will be. If you do not find that there is sufficient earning power to cover your entire charges, then you charge too little or you capitalize too high. The best exchange in the world will be an utter failure if you do not receive adequate compensation for the service rendered, and its securities will not be good. Telephone securities are good and desirable as an investment only when the conditions behind them are of a character to indicate permanence, stability, strength and earning power equal to and greater than the immediate necessities of the company.

All exchanges cannot be measured by the same standard. For instance, one inexperienced in such matters would naturally enough say that if you have built an exchange in one locality having a capacity of 500 telephones at a cost of \$50,000, you certainly can build one with a capacity of 5,000 telephones at a cost not exceeding \$500,000, yet experience has demonstrated that the cost per instrument in the larger exchange is more than double that of the smaller, so almost necessarily you must judge of each particular exchange to determine when the capitalization is reasonable and its securities safe and desirable as an investment.

The rentals received for service being the only source of income from the business, they must be adequate, or an inability to pay current expenses, keep up repairs and pay interest and dividends will very quickly manifest itself. First of all, the equipment and construction should be absolutely up to date, and first class in every particular. Second, the cost of material and construction should be kept within due bounds and not left to chance, but figured out to a cent. Make your plans full and complete and work up to them to the letter. Third, do not be lured into over-capitalization; remember you must pay interest on each bond issued and should pay dividends on your stock. Fourth, beware of wind and water. Too much wind injected into your enterprise is likely to produce a superfluity of water. Blow out the wind, wring out the water, and get down to solids and stay there. When you issue bonds, do so against values, against earnings, and be sure that there is enough back of them to furnish a solid basis of credit. Hold in the treasury enough securities to provide for betterments and extensions properly and duly safeguarded from imaginary wants, only to be issued against actual values. Fifth, avoid the mistake of supposing that you can successfully operate an exchange at a greatly reduced rate of rental. Good service should always command reasonable compensation. Do not seek to reduce rates, but strive to improve the service to the end that Independent securities may be placed on a permanent and stable basis.

I venture the prediction that out of the thousands of Independent exchanges, with an investment of over \$150,000,000 serving more than two million subscribers, not 1 per cent thereof will ever default on the interest or principal of their bonds, even at the present rates charged for service.

Many of the smaller exchanges which have been struggling

*Abstract of paper read at Inter-State Convention, Chicago, Dec. 9, 10, 11.

under a heavy load will be pulled into comfortable shape by the Independent long distance lines which are now reaching out from all the larger exchanges and coupling up the little fellows, so that ultimately they will be brought into the fold, and after a while become part of a great consolidated interest.

If I were called upon to express an opinion or give advice as to the most important thing to be done by an Independent company to insure its success and make marketable its securities, I should say: Attend to your own business and let the party in opposition have a monopoly of the brag and bluster, knowing that a fair-minded and discriminating public will protect itself by giving you the lion's share of the business.

But the investigator with his ever ready question is abroad, and in this inquiry he is to be reckoned with. First, he is solicitous to know how it is possible to maintain two opposing telephone exchanges in a single town on a paying basis? The history and experience of every town having two exchanges in which a first class Independent exchange has been inaugurated has demonstrated that the increased number of telephones in use is equal to or greater than the number in service when there was only one exchange. As an illustration: take the telegraph companies in nearly every town in the country, the Postal and Western Union compete for the business. The Western Union occupied the field first, and there were few people who did not believe that it would be impossible for the Postal to sustain itself, yet we all know that the increased business, at the reduced rates enables each company to protect its bonds and pay its stockholders, and the future will see the history of the telegraph repeated in the telephone.

Yet again the inquirer says, suppose you are on a paying basis

at present, what assurance has the investor in your securities that you will be enabled to maintain the rate and retain your subscribers, so as to give you a definite and fixed income, with which to meet your obligations?

Let the incontrovertible facts answer the question.

First: It is conceded on all hands, and has been fully demonstrated by the test of time that the telephone is no longer in the category of luxuries, but it is a household and business necessity. You can no more get along without it in your business than you could dispense with the mail; as a means of economy it pays its hire many times over each month, and as an aid to business it is indispensable.

Second: The wonderful and continuous increase in the number of telephones in service is proof positive that the growth of the exchange is natural, permanent and certain, insuring continued and increasing patronage.

But, says the inquirer, your facts are general and apply as readily to the Bell as to the Independent, and it is the Independent securities that we are concerned about. Please answer definitely.

Again let the undisputed statistical facts make answer.

The Bell Telephone begun its business career a quarter of a century ago, without competition, let or hindrance, backed by countless millions, under a management shrewd, energetic and skilful; protected by letters patent and the most astute lawyers that money could employ, and after a wonderful career in an unobstructed field the entire number of Bell telephones in use to-day is only a little more than 1,000,000, whilst the number of Independent instruments in service is in excess of 2,000,000; a most marvelous record, when you consider that the age of the oldest Independent exchange is less than eight years.

MEASURED SERVICE RATES*

By GEO. N. BANDY.

OF all public utilities, gas appears to have been the only one charged for from the beginning according to quantity consumed. Until recently it was a common practice, and is yet the custom in many places, for water companies to charge according to the number of rooms in a house or number of front feet in the lot; now the modern practice is to charge a certain rate per thousand gallons. It was formerly the rule for electric light companies to charge for a current according to the number of lamps connected, but now an up-to-date company charges according to Watts or the actual quantity used.

The pioneers in the telephone field, who, by the way, were the various Bell licensees, not having at the time the telephone was first brought into commercial use, apparatus by which the number of calls could be accurately recorded, adopted the expedient of charging for the service an arbitrary rate per month, having a higher rate for business than for residence telephones. This practice still largely obtains among the Independent companies, but the Bell licensees are breaking away from that custom as rapidly as possible; especially is this true in the larger cities.

There are several reasons for making the change—it yields a larger income per telephone; increases their list of subscribers, and, last, but not least, rids their patrons of that intolerable nuisance known as a "dead-head," who uses your service in many cases more than a regular subscriber without paying therefor, and ninety-nine times out of one hundred not only fails to show his appreciation of the convenience by thanking the company or subscriber, but is loudest in his denunciation of what he is pleased to call "the rotten service" the company is furnishing.

Many of the Independent companies have profited by the mistakes of opposition companies, but I am sorry that there is a large number who have not made the most of their opportunities. We are now able to purchase telephone apparatus that so far as their signaling and talking qualities are concerned seem well nigh perfect, and are certainly equal, if not superior to, anything used by the Bell licensees. This being true, why should we hesitate to adopt "measured service." It is certainly fair to both the patron and to company, and I see no good reason why the change should not be made.

For a number of years the word "Independent" has had a wonderful influence upon the public, and during that time they have given us their confidence, good-will and money, and are now not only requesting but in many cases are demanding that they be furnished not only with first-class but modern service, embodying the latest ideas. It is therefore plainly a question of the survival of the fittest, and if we expect to remain in this business it is only too evident that we must be continually on the alert for and introduce the latest and most approved type of apparatus and inaugurate such changes in the handling of and charges for telephone service as seem appropriate and satisfactory to the public.

I believe that the majority of our subscribers would welcome a change from the present flat rate system to the "pay for what you get" principle. It may be, however, that the apparatus for recording the number of calls is not sufficiently perfected to warrant our making this change, but as necessity is the mother of invention I confidently believe that if it is shown that the apparatus now available for this purpose is not efficient that someone will soon place on the market an instrument that will meet our requirements.

In charging for telephone service on the meter basis, it may be necessary, of course, to have the subscriber guarantee a certain number of calls per month; for instance, a residence telephone might guarantee twenty-five calls at four cents each per month; all in excess of that number to be charged for at three cents per call; business telephones, \$2 per month for forty calls; all in excess of that number, three cents per call, the guarantee as to minimum number of calls per month to be varied to suit local conditions, no calls to be recorded unless the number or party called is obtained, and all incoming calls free.

These are merely brief suggestions for reflection. There are various ways offered by others for accomplishing a similar purpose. An idea laid down by a prominent telephone man as long ago as 1895 has been adopted for practice by a number of telephone companies. It has later become the rule in some foreign countries. It is to first charge a flat rate, covering a reasonable amount for the subscribers' station maintenance, then a charge additional for the service, or a switching rate of so much per call, varying from two to six cents for exchanges.

This subject must have an important bearing on our future, so we ought now to begin to learn all about it.

*Paper read at Inter-State Convention, Chicago, December 9, 10, 11.

CONTEMPORARY CROSS TALK

By the Listening Key.

A POINT that has a most important bearing on the duration of the average local telephone message is the vexed question of telephone etiquette. Telephone etiquette is occasionally discussed in the periodical literature of the telephone, and every now and then is the subject of a few, more or less flippant paragraphs in the newspapers. But the proper observance of correct telephone etiquette is of the utmost importance to the attainment of an efficient and economical service, and its non-observance is not only irritating to one of the two subscribers concerned in the message, but is the cause of much unprofitable work on the part of the telephone plant. What is the object of a telephone call? In nine cases out of ten, probably it would be truer to say in ninety-nine cases out of a hundred, it is to exchange a personal communication—a series of spoken telegrams—between two specific individuals. Occasionally it is not important that the message be delivered to a specific individual at the called end of the line; perhaps a clerk or some member of the household will do. But much more generally one particular person is wanted, and at the calling end of the line it is, of course, invariably one specific individual who is to be the speaker of the message. Therefore the quicker the two specific individuals who are to exchange the message, get together on the line, after the machinery is started to give them a direct line of communication, the quicker will be accomplished the object for which that machinery was set in motion.

* * *

The telephone company strains every nerve to give the two individuals a direct line of communication as quickly as it can be put together after the order to build it up has been given. All its plant and machinery, its elaborate switchboards fitted with all the refinements of automatic signals and appliances for rapid working, that brilliant invention and patient experiment have been able to produce, its costly cables and lines and its many auxiliary devices are planned, devised and installed, and carefully maintained in working order, with the one object of providing two individuals with a direct and effective line of communication as rapidly as possible after the order for it has been given. With the same object, that the plant and machinery may be used as effectively as it is intended to be used, the telephone company instructs, trains and supervises with the most scrupulous care a large staff of workers, who become skilled in operating the plant at high speed and maintaining it in perfect working order. In short, the one object at which all the complicated machinery of a telephone system and the efforts of all the staff—from the president down to the office boy—are aimed is the readiness and ability to put any two individuals who are customers of the system into direct communication with each other immediately after the order for such communication is given. To this end every possible refinement in plant and machinery that has a proved practical value is adopted, and the utmost care and skill are devoted to the organization and training of an efficient staff.

* * *

The result is that the actual work of connecting two stations together is done within a few seconds after the order has been given. How does the customer, the average telephone subscriber, respond to and aid this efficiency in accomplishing the object of the connection—the exchange of messages between two specific individuals? Here we come to the question of telephone etiquette. In ordinary life one of the very rudiments of etiquette—that is of plain, common, every-day politeness—is that you should answer promptly when called or spoken to. Yet, as we have seen by our analysis of the various steps of the operation of the average telephone connection, the time taken by the subscriber to answer the call is greater than that occupied by all the rest of the work of replying to the original signal and of building up the connection. This is the first breach of telephone etiquette that the average telephone subscriber commits. He demands rapidity and efficiency from the telephone company, but he is not willing to be rapid and efficient himself, and more than half the total time occupied in making the average telephone connection effective is attributable to his own slowness in answering the call.

* * *

As one breach of the conventions generally leads to others, often more serious than the first, so it is in this case of telephone

etiquette. The fact that many telephone subscribers are slow in answering their telephone bell causes other subscribers to be unwilling to waste their time by waiting at the telephone until the called subscriber appears on the line. Consequently many subscribers have the habit of making their calls by deputy and only go to the telephone themselves when they are assured by the deputy that the person they want to talk with is actually on the line. Now this practice is not only time-wasting, but it is aggravating, almost insulting, to the immediate victim of it—the called subscriber. The telephone company is also a victim, since it suffers by any unnecessary prolongation of the time occupied by the average connection; but for the present we will leave the telephone company out of the question. The subscriber who is often a victim of this practice of calling by deputy, if he be a person of sensitive disposition—and most telephone subscribers have very sensitive dispositions—is very apt to retaliate in kind and answer all his calls by deputy, and so the vicious circle spreads.

* * *

The deputy is usually the office boy, and it is not too much to say that the office boy is the curse of the telephone service. It would be a good thing for business in general, and for the telephone business in particular, if it were made a penal offense for any male to use the telephone service until after he had passed his majority. The average office boy looks on the telephone service as a delightful means, delivered into his hands by his kind employer, for venting his natural propensity to make mischief and trouble. One office boy at one end of the line is bad enough, but an office boy at each end of the line gives the depth of degradation to which that highly organized machine, the telephone service, can be condemned. The office boy is almost always uncivil, or at any rate so brusque and awkward of speech that he sounds uncivil over the telephone, which comes to the same thing; he is generally careless and irresponsible and very often hopelessly stupid. Consequently he is the last person to be entrusted with the working of the telephone. Yet many people allow him to be an intermediary in all their telephone calls, and are quite oblivious to the injustice they are so responsible for toward their correspondents, toward the telephone company and toward themselves. Every telephone subscriber theoretically demands good telephone service, yet many telephone subscribers practically prevent themselves from getting good service by allowing their office boys to operate the system.

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It is true that the office boy is not the unmitigated nuisance he once was on the telephone system. The great improvement in the service, the extensive adoption of desk telephones and of branch exchanges under the care of skilled operators, have resulted in a more direct use of the service by principals and have somewhat ousted the office boy from his former proud position of autocrat of the telephone. But the habit of calling by deputy is still quite sufficiently general to be a distinct evil, and even if the calling be done by a grown-up clerk, who has sense enough to be polite and business-like, or by a well-mannered young woman stenographer, the principle is the same; the breach of telephone etiquette is just as annoying to the called subscriber and the waste of time to the plant just as serious. If I have a telephone on my desk, and on answering a call am greeted with "Is that Mr. Key? Well, wait a minute please, Mr. Plug wants to speak to you," I am justifiably annoyed by the unwarranted impertinence of Mr. Plug in assuming that my time is less valuable than his; I am also annoyed by the actual waste of my time while I am waiting to hear Mr. Plug's amiable salutation and if I am as my name denotes, a telephone man, I am also annoyed by the unprofitable employment of the telephone plant during the time I am kept waiting for the sound of my ill-mannered correspondent's voice.

* * *

In effect, the man who calls me by telephone through his stenographer, or clerk, or office boy, says to me: "I suppose you are there, or I should not call you, but in any case my time is so much more valuable than yours that if you are there I am going to keep you waiting at the telephone, after I have found out for certain that you *are* there and got you to the telephone, until I have been informed that you *are* at the telephone and have had

time to drop what I am doing and get to the telephone myself or have you switched on to the telephone at my elbow; I may even be doing something that I cannot drop instantly, so you may have to wait at the telephone a minute or two." Now I may be the veriest dullard and plodder, with time to burn, yet I naturally resent a message like that. But I am hardly able to enforce my resentment, because my correspondent in his thoughtlessness is in all probability ignorant that he has sent any such message and is

quite innocent of any intention to give offence. Yet every telephone subscriber who habitually calls by deputy, habitually sends such a message to his correspondents, and unless some of them feel on sufficiently intimate terms with him to point out to him the injustice and unreasonableness of his method of using the telephone, he is likely to go on committing this breach of telephone etiquette, causing offence, provoking retaliation and wasting time all round to the end of his telephonic days.

SLIDING SCALE RATES FOR TELEPHONE COMPANIES*

By DR. HENRY S. HERR.

THE flat rate system incorporated into many of the franchises granted to different Independent companies by city and town councils has been the direct cause of more poor service, poor construction and poor maintenance than any other cause that I can think of. Because of the fact that none of the Independent companies were aware when they began business that to maintain a telephone system it would cost more per telephone to care for 500 than for a lesser number, they soon found themselves paying out more money for maintenance and operating than they were receiving. A very popular price among promoters and a catchy price for the public is a rate of \$1 per telephone, this being considered an adequate amount in telephone systems under most favorable conditions for from 300 to 500 subscribers. That is not a sufficient amount to conduct the business and maintain the plant when the number is more.

A large number of telephone exchanges that in the beginning, when their subscribers were few in number, gave excellent service, are now giving very poor service, because expenditures consume all the receipts and there is nothing left for repairs or maintenance. And unless financial relief comes by means of advanced receipts, a very short time will put them out of business.

The eagerness of the Independent telephone people to right the wrong done the public in charging exorbitant rates by the company holding the original patent upon the telephone was the prime cause in promoting Independent or opposition telephone companies. They, like the hardware or grocery man, counted that the more service they could sell, the greater would be their profit, prices always being the same. One hundred barrels of sugar, or one hundred barrels of nails, can be sold by the merchant for less money per barrel than one, two or three barrels, and still the merchant would make greater profit on his investment by selling the large number at the same price than by selling the small number at the same price. And thus the pioneers of Independent telephony, when they turned their attention to the telephone business, thought if they could sell the service of a thousand telephones they could make the rate the same, or even less, than if they sold the service of only one-quarter or half that number. The comparison between sugar, nails and telephone business is not a fair one. When a barrel of sugar is sold that is the end of it; when a telephone service is sold it is only the beginning. Forever after there are wires to be taken care of, trouble to chase, lightning and electric currents that burn up the instruments to be switched off; and the more telephones you have, the longer distances are necessary to reach the subscribers, and many other things must be done. When nails and sugar are sold, the merchant receives all his cost and profits; when a telephone is placed, only a small portion of the cost is paid in the service, and years are required to balance accounts. But to give telephone service to 1,000 subscribers, a central apparatus must be provided at a cost of no less than one hundred times as much as the central apparatus will cost to give service to 100 subscribers. Ten exchanges of 100 subscribers, at \$1 and \$2 a month, will bring a handsome return to the owners, where one with 1,000 subscribers at a cost of \$1 and \$2 per month will be a positive loss without any provision for maintenance. Still, in each case, a thousand subscribers are served.

By the sliding scale of rates for telephone companies is meant a scale of rates based upon the number of connections given subscribers in any one system. The importance of such a rate is well understood by the older companies, as shown by the sliding

scale of rates as used by the American Bell Telephone Company at the advent of Independent telephone companies.

The value of the telephone to the users is in the number of subscribers who can be reached in any one system, and it is no more than just that the telephone company should receive a proportionate share of the value that the telephone is to those using it, whether for business or pleasure. And it is also fair to the users of the telephone that they should not be required to pay more than is necessary for good maintenance and good service with a fair profit to those who have invested their money in the telephone system. This equality can only be accomplished by the sliding scale of rates. If the cost of future maintenance was always known, it would be an easy matter to incorporate rates in telephone franchises. But as this is not the case it remains a question whether or no it is wise to do so. I am of the opinion that there will be no difficulty along this line if telephone companies will do a fair and honorable business and make their rates proportionate to the service rendered, with a fair dividend for money invested. By maintaining reasonable charges there would be no danger of competition, unless it should be by someone trying to break a weaker company in order to obtain entire control and produce a monopoly in such a manner as to exclude others forever and then return to the prices charged during the life of the fundamental telephone patent.

What the sliding scale of rates should be, necessarily varies with the conditions under which the company must operate. In small companies, where it is not necessary to use tall poles or aerial cable or conduit work, placing the cables and wires underground, the rate can be less than in cities where all this is required. But no company can do business more successfully under the most favorable conditions in an exchange not to exceed 500 at a rate averaging less than \$1.50 per month for all telephones. This is usually accomplished by charging \$1 for residence telephones and \$2 for business telephones. Above that number it will be necessary to advance the rate a certain small per cent. as the number of subscribers are increased.

A number of telephone companies in the State of Iowa have been asked if, in their experience, they found the average cost of operating, including all expenses per instrument, increased or diminished, with the number of telephones installed, and what would be the number approximate at which a \$2 rate for business and a \$1 rate for residence on a full metallic system would be profitable.

The manager of the Des Moines Mutual Telephone Company placed the number at four or five hundred. Waterloo Telephone Company, Dr. Bennett manager, placed the number at four or five hundred; Fort Dodge Telephone Company made the maximum number at eight hundred; the Home Telephone Company, of Oskaloosa, at two hundred and fifty. In Iowa City a citizens' committee was appointed by the Commercial Club to investigate the proposed increase of rates by the Johnson County Telephone Company. After thoroughly investigating they reported that it was unprofitable for the company to do business at a \$1 and a \$2 rate with six hundred telephones in operation, one-half of which were business telephones and the other half residence telephones. This committee publicly announced that they were opposed to a raise of telephone rates when they were first placed upon the committee; but after their investigation they were convinced of the necessity of raising the rate to \$1.50 and \$2.50 until the number reached one thousand subscribers; thereafter 25 cents additional, the same rate to be maintained until the number reached one thousand five hundred, when another 25 cents should be added. This is a fair concession by the committee appointed for Iowa City.

*A paper read at the Inter-State Convention, Chicago, December 9, 10, 11.

SUGGESTED METHODS FOR IMPROVING LONG DISTANCE TELEPHONY*

By CHAS. E. HULL.

IMPROVEMENT is the slogan of this age. Especially is this true of telephony. The time was when almost any kind of an instrument or line would suit the otherwise progressive citizen. Any sort of communication by spoken words was progress and the poorest and often interrupted service was readily forgiven. Rapid strides are being made in improvement of instruments and the public is fully aware of it. We can but expect that they demand better if not perfect service. There are many reasons why Independent telephone service, ever improving, has not reached the highest standard of excellence. Nine-tenths in point of number of the Independent telephone exchanges have been built with the primary object of supplying local service and without any thought on the part of the promoters of any necessity arising whereby they would be called upon to extend their lines or procure for their subscribers and customers any communication beyond that afforded by their limited facilities. At the beginning of this enterprise the community served and the company furnishing the service were agreed and a unit as to the objects and uses of a local telephone exchange. But soon the people of a neighboring town or perhaps county seat, in their casual business with their fellows, perceive the advantages gained by their friends or perhaps rivals across the prairie, and forthwith over night plans were laid for the construction and operation of the Blankville Independent Telephone Exchange. Soon it was discovered that, although striving to outdo each the other, both commercially and socially, these adjacent communities must have opportunity to reach each other quickly. According to the advertisements in some public places that we may read while we impatiently wait for the answer to our call, *the mail is quick, the telegraph is quicker, but the telephone is quickest*. For this reason a connecting telephone line is proposed. It is hurriedly built. I say hurriedly, for the reason that additional facilities for communication between existing plants invariably brings a host of clamoring people who want their telephones installed instantly. Once the telephone habit has taken hold of a community there is no way to check it except by bad equipment, poor service and gross inattention to the wants of the people.

Emulating the example of the prosperous farmer in his endeavor to buy all the land that joins his, managers and patrons join the effort to reach surrounding communities. The undertaking is laudable and popular. Lines are built that answer for the time and the interested communities are happy and contented. The circle ever widens and all goes well until its outward boundaries touch and overlap a similar telephone system.

The two systems are joined at perhaps some out-of-the-way place, without any thought of the consequences, and an announcement is made that each system is ready for "through" business with the other. Satisfied subscribers vanish. There seem to be no calls for the service now asked for prior to this time. But now that it is within reach it must be furnished. Any up-to-date manager can read the handwriting on the wall. He must not be weighed in the scales and found wanting. It is useless for him to explain that the fault is at the other end of the line. Whatever it is, it must be remedied. It matters not if the remedy involves the expenditure of more than his plant can comfortably afford; it must be done. The high sounding title and the far-reaching import of the subject under such a title are calculated to mislead. The manifest inadequacy of sufficient suitable means of telephonic communication between Independent exchanges within our association prompts the subject. The primary object of the suggestions offered will be looking more to the ways and means of securing the needed better "local" long distance communication rather than purely "long distance" telephony. There is but one solution to the latter problem. One company or a system of connecting companies must furnish such service to the Independent field. Until the Independent movement obtains sufficient foothold in the larger commercial centers, provision must be made, more or less local in its nature, for carrying for "local" long distance

messages and especially such cases as I mentioned at the outset. For instance, in my own State of Illinois, there is hardly a link out of the chain of Independent exchanges from Egypt to the Wisconsin or from the banks of the Wabash to the Mississippi. We can each of us hold communication with our neighbor on either hand, and perhaps with our neighbor's neighbors, but beyond that we must resort to the unsatisfactory practice of repeating the message. What shall be done? My many letters of inquiry directed to many exchange managers brought no satisfactory solution or answer. Strong companies are occupying the larger inland cities of the States. How are the smaller inland cities and towns to reach them satisfactorily? The composite ideas to my inquiries seem to be embraced in the following three propositions:

First.—That the present system of lines connecting individual exchanges be continued and improved.

Second.—That companies be formed along a given route to build metallic, standard construction lines to operate in conjunction with the already established exchanges, the stock in the company to be subscribed by connecting systems.

Third.—That encouragement be given to the formation of entirely Independent long distance companies who will connect on favorable terms with individual exchanges.

The general sentiment seems to be that whichever of these ideas seems to be best or a combination of the three will be readily adopted by all concerned other than building standard construction.

The most practical suggestion for improving present conditions is that new lines be run under present conditions on the same poles as now, with no telephones connected, and that these lines terminate in open jacks on the respective switchboards of the different companies or stations. When a so-called through message is to pass several switchboards, operators are to be notified to connect the new line by means of these open jacks. This would be at best a makeshift, but certainly would be a vast improvement on present conditions.

The second plan presents some complications which will be hard to overcome. The theory is a good one. It seems to me that practice will demonstrate that it will be a difficult matter to adjust the different ideas and conditions which will be brought into such an organization. It would seem strange if any two stockholders in such a company would come under similar circumstances.

The practical system for the advancement of the Independent telephone movement, it seems to me, would be a combination of the three ideas above suggested. There is a great deal of purely local telephoning that is offered subscribers so cheaply that no long distance company could undertake it. Under this head comes free county service. Lines of the long distance company could be run to the main office of such a company with the understanding that all incoming lines from other stations be of standard construction. Better still, the long distance lines should touch each exchange. Through business should be given the long distance company; direct and local business to remain with the home company.

Conflicting interests are so diversified and individual wants so varied that the best thought of the best men among us will be necessary to bring order out of chaos. The betterment of existing facilities for the transmission of messages will not accomplish all of the result desired. We must adopt some definite plan of action and have better facilities for the settlement of our accounts, and (I am sorry to relate) our differences, together with a board whose business it is to adjust all these things. These last mentioned matters, of course, do not concern the general public, but they are of vital interest to us. We should be the people who are endeavoring to lead the movement into a sound business policy. By so doing we will gain the confidence of the financial world and thereby be enabled to make all the necessary improvements to our plants so that we can give to the public the best service known in the science of telephony.

*A paper read at the Inter-State Convention, Chicago, December 9, 10, 11.

SETTLEMENT OF TOLL BUSINESS BETWEEN CONNECTING COMPANIES*

By A. L. HUTCHINSON.

THE ultimate success of any enterprise depends upon the ability of its management to do business at profitable prices and to collect the full compensation when earned.

In these times when competition is so keen that large business concerns must look after the smallest details of their expense accounts that the profit and loss account does not show a balance on the wrong side of the ledger at the close of the year, how much more necessary is it for a telephone company whose gross earnings are made up of a great many exceedingly small sums, to be absolutely sure that every penny earned by it is charged to the proper source and duly collected.

A single telephone company doing business over its own wires exclusively can check its own business and know that every station is collecting and accounting for all services rendered. But with Independent telephone companies fairly swarming over the country which have more or less joint business with each other, their business transactions become as complex as the business transactions between individuals and we have a problem which calls for the simplest solution possible.

The transactions of business between connecting telephone companies is without a parallel. Railway systems may have joint traffic arrangements, but when a car or a train of one company passes to the tracks of another it only occupies as much of the connecting company's tracks as the rails required to stand upon, or the block in which it is running. Telegraph systems may have joint traffic arrangements, but the messages are transmitted in relays and only the wires of a single company are in use at a time. But when you step into the telephone office at A to tell your wife at B that you want to be at home for a week, you are monopolizing one complete circuit from A to B to the exclusion of every other person who wishes to use any portion of that circuit at the same time.

Therefore a system for taking care of the business of connecting telephone companies is demanded which will fill the following requirements:

The system must have a uniform method of ascertaining the rate between any two points which should be based upon the air-line distance between those two points, whether the message passes over wires running upon the air-line route or in the most roundabout way, and whether the wires necessary to complete a circuit between the two points belong to two companies or a dozen companies. And there must be a uniform system of dividing the fees received among the connecting companies.

To illustrate: You are in Madison, Wis., and you wish to communicate with Sweet Home. The operator knows only her own sweet home, but you tell her that Sweet Home is in the northwest corner of Hoosierdom, and she turns to a map, lays down a ruler, and instantly tells you that you can talk five minutes for \$1.20. You are in a rush, as your train leaves Madison in 15 minutes. The operator therefore calls for Sweet Home, Indiana, and in a short time you are talking with your wife. To make that connection we will say, wires of six different companies have been brought into use and you are monopolizing them all for the time being.

There is no traffic arrangement between the company at Madison, Wis., and the company at Sweet Home, Ind., nor with any of the four intervening connecting companies which we will designate as A B C and D, and yet each and every one of those companies must be ready to furnish the use of their wires without stopping to ask how they will get paid for their services, else valuable time would be lost, and you would have to leave for your train without talking, while the companies would be out \$1.20. Hence there must be a system by which each company shall share in that \$1.20, and that each company will know that its share is looked after without any special effort of its own other than making a record of the message.

It is not the province of this paper to say what the basis of the division of fees should be, nor what should be the schedule for determining the air-line rates for joint messages, but to urge the necessity of a uniform system that shall be recognized by every Independent telephone company in the United States.

In the illustration, the operator at Madison makes a record

of your message, and at the end of the month reports it and transmits \$1.20 to the proper officer of her company. The Madison Company thus far is \$1.20 ahead. The operator at Sweet Home also makes a record of your message, and at the end of the month sends it to the proper officer of her company, which we will say has its headquarters at South Bend. The two terminal companies thus have records of the message, but of the four intervening companies two checked the message, and the other two in the rush of business made no records of it. We will say that the operators at A and B kept a record of the message, but C and D let it pass unrecorded. Now without a system for handling joint business C and D would not only not have a record of the business, would have no information that they had a claim against any company, in fact would not be apprised that they had performed any services for you.

It follows, then, that there must be a central office to which the operator at Madison must send a record of your message. It also follows that the operator at Sweet Home should send a message to some central office, and it also follows that it is best for each intervening company to have at least one of its operators check and report that message to some central office.

There should be at least one central office in each state. For the present illustration we will assume that there is one such central office in each Wisconsin, Illinois and Indiana. Now as your message originated in Wisconsin, the record should be transmitted to the central office in Wisconsin. To enable the central office in Wisconsin to know that the record as received from the Madison company is correct, it should receive a report from the operator at Sweet Home as well as checking slips from the intervening companies. The central office is then enabled to apportion the \$1.20 for your message among the six companies, and if any one of the six companies has neglected to report it, or even if all the intervening companies have neglected to report it, their shares of the \$1.20 are determined and credited to their respective accounts.

Now we will suppose that a commercial tourist at South Bend wishes to talk with a customer at Madison. The terminal companies are the same, the joint rate is the same, and the connecting stations are not the same. The South Bend operator then reports that message to the Indiana central office, as does the Madison company and each of the intervening companies.

At the close of the month each central office sends a statement of the joint business to each connecting company as made up from reports received by it. Thus, we will say, the Madison company receives the Wisconsin report showing that it owes the South Bend Company 25 cents, A 10 cents, B 15 cents, C 21 cents and D 14 cents. It also receives a report from the Indiana central office showing that it has a credit of 20 cents for the message sent from South Bend, so the Madison company transmits 5 cents to the South Bend company and their account is settled. Both the Madison and South Bend companies then transmit the proper amounts to the connecting companies and the transaction is closed.

There may be a thousand and one combinations which enter into the work of the central company in ascertaining the balances at the end of the month, but they are all worked out in the same way. Of course among companies of a single state the system is not as complex, so I have chosen an illustration involving three states. This method enables every company to have its business carefully checked and to know if some of its operators are negligent, there are others who are watching its business and looking after its interests as carefully as though an officer of the company.

Now what should this central office be, what duties should it perform and what should be its responsibilities? In answering these questions I shall make use of my own personal experience for, no matter how nice a theory may appear, when reduced to plain reading, its utility depends entirely upon actual results obtained by putting the theory into practice.

The central office should be a clearing office in the true sense of the name. All joint messages should be reported to it. The original record slip should be compared with the receiving

*Abstract of paper read at Inter-State Convention, Chicago, Dec. 9, 10, 11.

record slip, and if more than two companies are involved, the checking slip should be made use of, where the terminal records do not agree. All stations should report to the clearing office at least four times a month, as the earlier an error is detected, the easier it is corrected, and all errors should be corrected and the station in error notified of the correction at once.

The clearing office must open an account for every station with every other station to which a message has been transmitted. At the end of the month the separate station accounts must be brought together, and all companies having joint business with each other must be included in a single statement. The balances between the several companies in a single statement must then be brought together and the clearing office must designate what amounts are payable, and to whom payable, to balance the accounts of all companies included in that statement.

While to those unfamiliar with the system of the State Telephone Clearing Company of Wisconsin, all this work would seem to be a complex and laborious task, yet several months experience with the system of that company has demonstrated that it is simple, it is absolutely correct, and it is so flexible that it may be adapted to the conditions of any schedule or traffic agreements between connecting companies.

I recall one statement for October which showed a total of

738 messages, with a total revenue of \$128.00 divided among 18 companies. Twelve drafts amounting to \$13.89 paid by six of the eighteen companies to the other twelve companies settled the entire business for the month.

The cost was one cent per message to each company sharing in the fee of any message, and if each company had attempted to check and settle its own business with each of the other 17 companies, reports from each of the other 17 companies would have been required, it would have been obliged to report to each of the other 17 companies and it would have been obliged to make a monthly balance sheet for each of the other seventeen companies.

The clearing company should be a company distinct in itself, and it should not be a mutual affair. I know it is claimed by many that the clearing office should be an office in which all companies should have an interest, but while this might be satisfactory, yet like the Mutual Telephone Company which starts out to do business by compelling every subscriber to be a stockholder, it soon finds it advantageous to take in subscribers who are not stockholders, and as the clearing company is not a company which demands the investment of any considerable capital, and as its duties are to serve all alike, it should be as distinct from the operating company as is the factory which manufactures the instruments. Its business is a business distinct in itself.

RESTRICTIONS BY MUNICIPAL AUTHORITY, AND SYNOPSIS OF THE LAW OF IOWA*

BY U. S. ALDERMAN.

ACCORDING to Section 775, code of Ohio, cities and towns have the power to authorize and regulate telephone wires, and the poles and other supports thereof, by general and uniform regulation, and to provide the manner in which, and places where, the same shall be placed upon, along or under the streets, roads, avenues, alleys and public places of such city or town, and may divide the city into districts for that purpose.

Section 776 says no franchise shall be granted, renewed or extended by any city or town for the use of its streets, avenues, highways, allays or public places, for any of the purposes named in the preceding section, unless a majority of the legal electors voting thereon, vote in favor of the same at a general or special election. The council may order the question of granting, renewal or extension of any such franchise submitted to a vote at a general election, or at one specially called for that purpose; or the Mayor shall submit said question to such vote upon the petition of twenty-five property owners of each ward in a city, or fifty property owners in any incorporated town. Notice of such election shall be given in two newspapers published in said city or town, if there are two, if not, then in one, once each week for at least four consecutive weeks. The Clerk shall prepare the ballots and the proposition shall be submitted as provided for in the chapter on elections. The party applying for the franchise, or for a renewal or extension thereof, shall pay all expenses incurred in holding the election.

Any city or town by complying with the law may elect Park Commissioners, and when so elected said Park Commissioners (Sec. 875) shall with the advice of the city engineer superintend the stretching or laying of telephone wires, in the manner provided by the ordinance of such city.

In Iowa we have a few cities under special charter. In these the law is somewhat different than in all other cities and towns. The difference is, however, so small and the limitations so nearly alike, that I do not here give them.

Sec. 2158 provides: Any person or firm, and any corporation organized for such purpose, within or without the State, may construct a telephone line along the public roads of the State, or across the rivers or over any lands belonging to the State or any private individual and may erect the necessary fixtures therefor. When any road along which said line has been constructed shall be changed the person, firm, or corporation shall upon ninety days' notice in writing remove said lines to said road as established. The notice may be served upon any agent or operator in the employ of such person, firm or corporation.

Sec. 2161 provides as follows: If the proprietor of any telephone line within the State or the person having the control and management thereof, refuses to furnish equal facilities to the

public and to all connecting lines for the transmission of communications in accordance with the nature of the business which it undertakes to carry on, or to transmit the same with fidelity and without unreasonable delay, the law in relation to limited partnerships, corporations, and to the taking of private property for works of internal improvement, shall not longer apply to them, and property taken for the use thereof without the consent of the owner may be recovered by him.

Sec. 2162. Any person employed in transmitting messages by telephone must do so with fidelity and without unreasonable delay, and if any one wilfully delays thus to transmit them, or intentionally transmits a message erroneously, or makes known the contents of any message sent or received to any person except him to whom it is addressed, or his agent or attorney, or wilfully and wrongfully takes or receives any telephone message, he is guilty of a misdemeanor.

The proprietor of a telephone line under Sec. 2165 is liable for all mistakes in transmitting or receiving messages made by any person in his employment, for any unreasonable delays in their transmission or delivery, and for all damage resulting from failure to perform the foregoing or any other duty required by law, the provisions of any contract to the contrary notwithstanding.

Sec. 2164 says: In any action against any telephone company for damages caused by erroneous transmission of a message, or by unreasonable delay in the delivery of a message, negligence on the part of the telephone company shall be presumed upon proof of erroneous transmission or of unreasonable delay in delivery and the burden of proof that such error or delay was not due to negligence upon its part shall rest upon such company; but no action for the recovery of such damages shall be maintained unless a claim therefor is presented in writing to such company, officer or agent thereof, within sixty days from the time cause of action accrues.

Sec. 3529. Provides that service of original notice may be made upon any agent of the telephone company.

Sec. 4807. If any person maliciously cuts, burns or in any way breaks down, injures or destroys any telephone post, or in any way cuts, breaks, or injures the wires or any apparatus thereto belonging, he shall be imprisoned in the penitentiary not more than five years, or be fined not exceeding \$500 and imprisoned in the county jail not exceeding one year.

Stock in telephone companies is not taxed. Taxation of the plant is fair; is made by the executive council (composed of the Governor and other State officers) on the actual value of the property. The taxes are paid by the company.

Our courts have treated the telephone litigation in the same light as telegraph. The precedent of the telegraph being followed as closely as the individual case will permit.

*Abstract of paper read at Inter-State Convention, Chicago, Dec. 9, 10, 11.

A DISCUSSION ON TOLL RATES*

By H. H. ROBINSON.

LONG DISTANCE, or, more properly speaking, interurban telephone service, was established in the early eighties by various licensees of the American Bell Telephone Company. The rates established for service over these lines were not based upon the cost of producing it from any information I have been able to secure, but rather upon the telegraph rates which at that time represented the only competition. These rates varied in different parts of the country from less than one-half cent to one and one-half cents per mile, and the time limit varied from five to ten minutes, although overtime was seldom charged. It was not until the incorporation, by the Bell interests, of the American Telephone and Telegraph Company that any considerable time and thought were given to this most important subject.

In the early nineties a rate convention was called by the American Bell Telephone Company and delegates attended from many of the licensee companies. As a result of this convention, and the vast amount of preliminary work which preceded it, a standard basis of computing rates was adopted, which not only fixed the rate per mile and established the time limit, but also established the method of computing overtime, measuring mileage and computing rates so as to avoid the odd cent. I will state briefly the main features of this schedule. All rates were to be based on a charge of one-fifth of one cent per mile per minute. The time limit adopted by the American Telephone and Telegraph Company was five minutes, and the limit adopted by other licensee companies was three minutes. In computing the mileage, it was decided that the air line distance would work a great hardship upon the companies because of the few routes which then existed and the roundabout way which nearly every message had to be carried. It was also decided that pole mileage would work a hardship on the patrons who were not responsible and should not be required to pay for the failure of the telephone company to provide direct facilities. Therefore, as a compromise, it was decided to use the nearest railroad mileage. Overtime was to be computed at one-third or one-fifth of the initial rate, according to whether a three or five-minute schedule was used, and in cases where this method of computation produced an uneven number of cents, the minute rate was fixed at the nearest nickel. In order to avoid the large number of uneven rates, which would exist if rates were based on the exact mileage, the following table was prepared:

5 miles or under.....	10 cents	51—60 miles.....	40 cents
6—15 miles.....	15 cents	61—75 ".....	45 cents
16—24 ".....	20 cents	76—85 ".....	50 cents
25—35 ".....	25 cents	86—90 ".....	55 cents
36—45 ".....	30 cents	91—112 ".....	60 cents
46—50 ".....	35 cents		

The only matter of importance not touched on by the Rate Convention was the subject of special rates for night and Sunday service, and it was not until 1896 that the licensee companies adopted the half-rate night schedule, and it was not until 1899 that the American Telephone and Telegraph Company followed suit.

In the latter part of 1899, or the early part of 1900, the American Telephone and Telegraph Company changed from a five-minute to a three-minute basis for all rates on either side of Buffalo and Pittsburg. Rates going from one side of this imaginary boundary line to the other side are still based on a five-minute period.

In certain parts of the United States, most notably in California, a period of fifteen seconds was introduced and has been quite successful, owing to the peculiar geography of that part of the country and the careful way in which subscribers were educated. One-minute rates have been introduced in various other parts of the country, but have not been successful, either from a financial or operating standpoint. The principal reasons for the failure of this short period to succeed were, first, because of the inability of the companies to furnish facilities in the shape of direct circuits, and, second, because of the magnitude of the task of educating so

large a number of subscribers separated into small communities, each having several centers of commercial influence.

To make this point more clear, I will say that, from the very careful study I have made of the subject, the fractional minute rate, or even the one-minute rate, will never be practicable until toll-line companies are able to furnish a sufficient number of direct circuits between points where it is desirable to establish such rates to promptly handle the business, and also to furnish each direct circuit with an operator at either end having no other business to handle. Furthermore, line patrons will have to be educated to the point of either transcribing or memorizing their proposed conversation before the connection is established.

It may be asked, "How did the Rate Conference arrive at its minute-message mile rate of one cent per mile per minute?" When I first decided to prepare this paper, I made a strong effort to secure from certain officials of the American Telephone and Telegraph Company the minutes of the first Rate Conference, as I preferred to quote from them verbatim. I was, however, unable to secure this rather important document, and I must therefore be content to briefly describe the process and line of thought by which the initial rate basis, which is now almost universally used, was devised. Let us create for our purpose a toll line property, consisting of 30 miles of pole line, 10 miles of which consists of the very best construction, forty 30-foot 7-inch top poles to the mile, with an ultimate capacity of 50 wires and a present capacity of 20. We will suppose that the second ten miles represents the average construction of thirty 25-foot 6½-inch top poles to the mile, with an ultimate capacity of 20 wires and a present capacity of 10 wires; the third ten miles to consist of a 25-foot bracket line, built upon the cheapest possible specifications and used presumably as a feeder to reach some small town. We wish to discover what rate we can safely make per minute-message mile and show a profit on our investment. Our first section will cost us approximately \$950 per mile or \$9,500, our second section will cost approximately \$500 per mile or a total of \$5,000; our bracket line \$150 per mile or \$1,500, giving us a total investment for this imaginary property of \$16,000. Figuring interest at 5 per cent., our fixed charges will be \$1,600. Operation and maintenance, including taxes and general expense and extraordinary maintenance, may be safely figured at 10 per cent. more. We must therefore earn \$3,200 per annum on the \$16,000 investment before we can show any profit for stock. We cannot, as in an exchange proposition, base our prospective earnings upon our number of subscribers and our average earning per subscriber, for toll business is strictly a measured service, and no matter how good our facilities, we cannot handle business until it is offered. The telephone day averages from four to seven hours per day, according to locality, and from several hundred peg counts which I have examined, the circuit load varies from one-half message per circuit mile per day to three messages per circuit mile per day. As we wish to be conservative, we must adopt the minimum figures if we would have a safe rate. Now this little imaginary system of ours contains 310 circuit miles. On the basis of one-half a message per circuit mile per day, we would handle 155 three-minute messages per day per circuit mile, and if these messages averaged ten miles, as they probably would, we would handle 1,550 message miles per day. To reduce this to minute-message miles we multiply by three, which gives us 4,650 minute-message miles per day, or 1,674,000 minute-message miles per year. Now we have seen that we must earn at least \$3,200 per year in order to cover our interest, depreciation, operation and maintenance; so by dividing \$3,200 by 1,674,000 minute-message miles, we find that we must charge and receive .0019 of one cent per minute-message mile. The Bell Rate Conference decided upon .002 of one cent per minute-message mile, and the result of our little computation shows that by charging that rate we will still have .0001 of one cent per minute-message mile to spare, on the basis of the most conservative figures we can possibly use. Please bear in mind that, aside from the estimated circuit load, the figures which I have used are selected arbitrarily and mean nothing except to demonstrate the line of thought.

*A paper read at the Inter-State Convention, Chicago, December 9, 10, 11.

ENFORCEMENT OF MESSAGE TIME LIMIT*

By H. E. RALSTON.

CAN there be any discussion on the subject "Shall We Enforce a Message Time Limit?" I can think of but one reply that shall come from the telephone fraternity, and that is "by all means." When we ask *do we enforce the message time limit*, I think we would get the reply from a majority of those present: "*By no manner of means.*" If we were to ask the question: "*Why don't we enforce the message time limit?*" we would be very apt to receive the reply: "For the same reason that we don't do a great many things that we know should be done," or "That we do a great many things that we know we should *not* do." And that is because we just got started in by letting a fellow have his talk out and we have never had the "gall" to call the public down on these long talks or charge them more for it.

Then it is suggested by some that the Bell is actively competing with them and that it has offended a great many by ruling to the strict time limit, and that in order to hit the Bell harder they have been silent on this score and felt that it was better not to mention the subject. To this man I would say: that "the Bell has hit you harder by sending you this kind of a customer than you have hit it by taking him and allowing him to use your already too busy wire from ten to thirty minutes for one fee, just because he would kick if he were limited to five minutes for one fee and excess for the additional time. "Bell" is rid of this kind of a customer and as a consequence has a greater capacity for handling business promptly, and that means satisfaction to the man that pays and is willing to pay for what he gets. That is the man that *you* should cater to and it will take business methods and prompt service to get and to hold his business.

When you find a man who will kick on paying an additional charge for a message talked over the limit, you will find him neither a pleasant nor profitable man to do business with. We have all tried the "flat rate" to some customers. Did you ever know of a man that had a "flat rate" for any kind of service who did not "kick" and try to get service for less money. If the service was cheap enough, it was not good enough. I only mention this to call attention that to some people there is no ground for "dealing" except the one way, and that is, so that they are getting more than their money is worth, and there is not a business man that will say for a moment that it is business to give more than the money is worth, and make a practice of it.

The more I have to do with the management of a telephone business, the *more* I think of measured service in every conceivable way, even to the smallest exchanges, and I am frank to say that if I were to begin again in the territory I have covered for my company, I would measure every service and would place telephones only on such terms.

Now, we will ask a few questions. Is it business for me to pay \$3.00 to ride 100 miles on the Burlington road, while my neighbor pays \$3.00 to ride 25 miles on the same road, or is it business for the railroad to charge my neighbor 75 cents to ride 25 miles and carry me 100 miles for the same price. The train will cover the distance whether we ride or not. It will cost the railroad company practically nothing to carry us, and why isn't it business to make a flat postage stamp rate and just carry a man any place he wants to go for one rate, regardless of excess weight or distance? This kind of argument is opposed to all kinds of business principles, but apply it to the telephone conversation and the man that is talking on the toll line is the only passenger that can ride. All others must wait until he arrives at his destination. Not only must others wait, but they grow as impatient as we all do when we find a railroad with its trains always behind the time. We look for a route that is more prompt and nearer "on time;" we look for a telephone line that is also run on schedule time so that we may finish the business we have in hand and go about our other business. The telephone

company that will eliminate the nonsensical visiting and useless waste of valuable time that is too often consumed in the way that messages are carried on over the telephone line, will soon find that men are willing to pay for business and quit the line when through, and that it will be ready for the next man that has business, and that will suit the business world, and our lines will become popular with the business world, and we will become successful operators. If we disregard these things and some others that we are in the habit of disregarding for the same reasons, we can figure the result from cause to effect, viz: if business methods will secure and hold business, then unbusinesslike methods will lose business.

In justification of the enforcement of the message time limit, I will ask one other question: If we are not to limit the message as to time, why do we limit the conversations as to number? If we will not say that a message shall not be longer than 3 to 5 minutes, why say that the user must pay for two messages if he talks twice? We will agree that we must measure service by counting the number of messages. Why do we hesitate when we are confronted with the proposition that this user has business that requires 6, 10 or 15 minutes in which to transact it? Now if the business is of the importance that requires the time, the time is of the value to the user that it is to the telephone company that has the line to lease to others that may be waiting anxiously to use the wire, and if we measure the service by its number, we shall measure it by its length.

The righteousness of the enforcement of the time limit, I think will not be questioned, and we turn to the enforcement of it; I don't take it that I am expected to prescribe a plan for the enforcement, as that is a matter of detail that is, and must be left largely to the individual line to execute, but if I were to offer to prescribe, I would say the only way to enforce is *to enforce*.

That there has been a mistake made in many cases by business men that have engaged in the telephone business, and that these men have long wanted to correct these mistakes, is not a matter of conjecture. It is time for us to counsel together and prevent making more mistakes in the future, and while we have made mistakes in the past of not establishing the time limit on toll line messages, and enforcing it, we should have the counsel of our associates in an earnest endeavor to correct this error without making a further mistake.

Is it wise for us to give a greater time limit to toll line messages than the Bell is giving? If it is, how much greater time limit can we afford to give? I would simply suggest that if the majority of the messages are of three minutes duration, then we should adopt the minimum of three minutes. If five minutes is nearer the time, then we should adopt the five minutes limit. We should endeavor to serve the public in this regard, and it is not our intention to agree to a regulation that will be oppressive to the public. This would be suicide. Yet, the public will never object to an equitable arrangement that will enable us to compete with the best up-to-date service that is being given by any company in quality of service as well as value for the price charged. In order to compete we must so operate our lines that we will receive a revenue that will make our business profitable, and enable us to make the improvements that will be necessary to meet the demand of the business world, and that demand is fast getting to be: *not how cheap, but how good is the service?* I am satisfied that to fix the limit at this meeting at five minutes, and to enforce the limit on this basis and charge one-fifth the charge for each additional minute (and collect it in every case) will not work a hardship on the public. It will materially increase the earning capacity of all our lines. It may be that three minutes, as made by the Bell company, is nearer the thing. Whatever we do, we should do in a business way, and if we decide to establish a time limit and enforce it, we should, every one of us—enforce it.

*A paper read at the Inter-State Convention, Chicago, December 9, 10, 11.

RESTRICTIONS BY MUNICIPAL AUTHORITY, WITH A SYNOPSIS OF THE LAW OF INDIANA*

By E. W. PICKHARDT.

THE State of Indiana, by statute, places the following restrictions upon telephone companies:

First, by the State, in the matter of incorporation, in that the articles of incorporation must set forth:

1. The name of the company.
2. The counties or places within which such company proposes to operate.
3. Amount of capital stock and the number of shares into which it is divided.
4. Must be signed by each of the incorporators, giving his residence and amount of stock subscribed for by him, five of whom (if there be so many signers), shall acknowledge the execution of such articles before some officer authorized to take acknowledgments of deeds, and the articles shall thereupon be recorded in the office of the Secretary of State, for which a fee must be paid as follows: For recording, \$1.50; charter fee, \$10 up to \$10,000 capital stock. If the capital stock exceeds \$10,000 the charter fee is one-tenth of one per cent of the capital stock. In case of consolidation of two or more companies the consolidated stock is taken as a basis and fees charged as above.

The State also fixes the liability of the individual stockholder by providing that he shall be liable in his individual capacity for any contract, debt or engagement of his company to an amount, over and above his stock, equal to the face value of the stock.

The State further requires incorporated telephone companies to keep a stock book at their office or principal place of business containing the names of stockholders, alphabetically arranged, showing their respective place of residence and number of shares held by them severally, and the time they became owners of the same, which book shall at all business hours of the company be subject to the inspection of creditors, stockholders or their representatives.

The State places restrictions upon companies organized in other States by requiring all foreign corporations to have and maintain a public office in Indiana, to have an agent or representative in Indiana on whom service of process may be had and such foreign corporation shall be subjected to all the liabilities, restrictions and duties which are or may be imposed upon corporations of like character organized under the general laws of the State.

Foreign companies, by which is meant those incorporated in any other State or country than Indiana, must file certified copies of their incorporation with the Secretary of State together with a sworn statement of the proportion of the capital stock of said corporation which is represented by its property located and business transacted in the State of Indiana, must pay incorporating taxes and fees equal to those required of similar corporations formed under the laws of the State.

Telephone companies are also restricted by being liable to taxation of which no better idea can be obtained than from the words of the statute itself, which reads as follows:

"Every telephone company doing business in this State, whether incorporated under the laws of this State, or of any other State, or of any foreign nation, shall annually, between the first day of April and the first day of June, make out and deliver to the auditor of state a statement, verified by the oath of the officer or agent of such company making such statement, with reference to the first day of April next preceding, showing: First, The total capital stock of such association, company, co-partnership or corporation. Second, the number of shares of capital stock issued and outstanding, and the par or face value of each share. Third, its principal place of business. Fourth, the market value of said shares of stock on the first day of April next preceding, and if such shares have no market value, then the actual value thereof. Fifth, the real estate, structures, machinery, fixtures and appliances owned by said associations, company, co-partnership or corporation and subject to local taxation within the state, and the location and assessed value thereof in each county or township where the same is assessed for local taxation. Sixth, the specific real estate, together with the permanent improvements thereon, owned by such association, company, co-partnership or corpora-

tion situated outside the state of Indiana, and not used directly in the conduct of the business, with a specific description of each such place, where located, the purpose for which the same is used, and the sum at which the same is assessed for taxation in the locality where situated. Seventh, all mortgages upon the whole or any of its property, together with the dates and amounts thereof. Eighth (a), the total length of the lines of said association or company; (b) the total length of so much of their lines as is outside of the State of Indiana; (c) the length of the lines within each of the counties and townships within the State of Indiana."

Municipalities in Indiana possess such varied and different powers of restricting telephone companies that it renders it necessary to examine this subject from the size of the municipality.

In the cities of more than 100,000 population this whole matter is referred to the Department of Public Works which has for its head a board of three members with a great many duties and powers, among which is the power "To authorize and empower by contract telegraph, telephone companies to use any street, alley or public place in such city, and to erect necessary structures therein, and to prescribe the terms and conditions of such use, *to fix by contract the prices to be charged to patrons*: Provided, that such contract shall in all cases be submitted by said board to the council of such city, and approved by them by ordinance before the same shall take effect."

In addition to these powers above set out each of said clauses of cities has a right "To regulate, license and tax street car, telegraph and telephone companies."

In all cities having a population less than 30,000 the law gives them the right to regulate and control the kind and location of poles used by telephone companies within the corporate limits. All cities, towns and counties have a statutory right to levy and collect taxes from telephone companies. All townships have statutory right to levy taxes upon them, but counties collect taxes for the townships.

The above are what may be termed the statutory powers possessed by municipalities. In addition to them municipalities have many inherent powers not enumerated in the statutes. Upon this point the Supreme Court of the State has said:

"By the enumeration in a statute of powers which would belong to a municipal corporation without specific enumeration, the statute containing such enumerated powers is not to be regarded as the source of power, but as merely declaratory of a pre-existing power, or rather, of a power which is inherent in the very nature of a municipal corporation, and which is essential to enable it to accomplish the end for which it is created. And the enumeration of powers, including a portion of those usually implied, does not necessarily operate as a limitation of corporate powers, excluding those not enumerated."

To these inherent powers we will have to look to see what restrictions may be placed by incorporated towns. One of these powers which is of necessity inherent is that of control of its streets and alleys and as a telephone line cannot be constructed in a town without crossing streets and alleys it follows that before its construction, consent to so construct must be obtained from the proper authority, which in our State is the Board of Trustees. Unless this consent is obtained any company that would erect or try to erect a telephone line in or through any incorporated town in Indiana would be a trespasser and liable to an action for trespass or to an injunction proceeding. This consent must now be obtained by and through an ordinance, which ordinance cannot go into effect for thirty days after its passage, nor until voted upon at the polls, if within the said thirty days a referendum is demanded by forty per cent of the legal voters of such incorporated town as shown by the last preceding elections. In the event the referendum is demanded it is the duty of the Board of Trustees to cause said ordinance to be submitted to the voters of said town at the next regular election therein if petitioned for by fifty per cent of the voters. It requires a majority of the votes cast at said election to cause the ordinance to go into effect.

In cities of less than 30,000 inhabitants and in incorporated

*Paper read at Inter-State Convention, Chicago, December 9, 10, 11.

towns it is especially necessary to look carefully to the ordinance or contract entered into, and if a company succeeds in getting a favorable franchise, erects its line according to contract there is little to fear from the restrictions that may be placed by such city or town upon the company thereafter. As cities of that size and towns have no right to fix taxes nor tax telephones; while in cities of 30,000 and over the company is liable to have the municipal authorities placing restrictions on its business along this line continually.

This can be guarded against almost entirely by the contract entered into with the proper city authority at the inception of the contract, but care must be taken therein to limit the power of the city to alter the prices to be charged patrons, and to limit its powers to levy a license tax upon telephones.

Municipalities, such as cities and towns, must necessarily have almost unlimited power over the streets, alleys and sidewalks therein, and in making a contract with a telephone company and granting its franchise the municipality has the power to treat with the company just as any other parties may contract. The matters usually considered in this contract are:

1. The time to begin the work.
2. The manner in which the work shall be done.
 - (a) Kind, height and location of poles.
 - (b) The height at which the wires are to be placed, etc.
3. The time for the contract to terminate which cannot exceed fifty years for the reason that the State of Indiana does not grant charters for a longer period than fifty years to telephone companies.

INDEPENDENT TELEPHONE SECURITIES AS AN INVESTMENT—FROM A SMALL INVESTOR'S STANDPOINT*

BY JOHN W. LAYNE.

IN the brief period of the past six years' history of our country, we have reason to be filled with exultant pride, for the brilliant achievements won by the marvelous growth of the Independent telephone system; also its expansion abroad throughout the civilized world against the most relentless monopoly—the American Bell Telephone Company.

It has long been known by many that the capitalists of the more remote cities of the east, have not only been timid of Independent telephone securities, by reason of being unable to comprehend the rapid growth and development of the telephone system of our Middle and Western States. Our progress has been much retarded for want of more capital for the betterment, and to meet the increased demand for telephone service; hence the importance of better knowledge of telephone securities, and where to place them. Rate of interest was never so low, and all industrial securities in shape of bonds and stocks are sought after, with the single exception of the Independent telephone securities.

Why this discrimination by the investors, in the face of our present financial prosperity, is now the paramount question for our consideration at this time. I will venture the assertion, fully three-fourths of all the Independent telephone companies would like a solution of this question, whereby they might receive just and equitable consideration for their securities, as other industrial enterprises receive for theirs.

We have by our untiring energy won one of the essential points to be desired by the capitalists, that of *stability* and *permanency* of maintaining our holdings, both in patronage and manifest loyalty of the public, wherever we establish our exchanges. No other industry coming into existence for so short a period, can show so large a percentage of increase, or a larger dividend or profit for the capital invested, as that which can be shown from the books of the Independent telephone companies. Even after due allowance has been made for deterioration, still but few other enterprises will show better results. Again, no other industry has greater prospective growth of expansion, by reason of the fact that it is universally acknowledged that a telephone is an indispensable necessity in every business as well as the household.

No longer the threatened "crushing out of the Independent telephone companies" by the old monopoly, which so long held the field, menaces the safety of our systems, so long as good service is maintained.

The Independent telephone companies by their indomitable energy and courage, sprang into the competitive field in such numbers that the "monster crusher" from sheer exhaustion of the long continued fight (using the common parlance of modern slang) "has gone away back and sat down."

Also the Independent telephone companies, and others hold-

ing their securities, entertain now no doubt or fear of being "crushed out" or of their ability to maintain their holdings, and the loyal support of the people.

From my own experience, as well as information derived from other sources, the easiest way of floating telephone securities, is to enlist the aid of the local capitalists, using the same energy you have displayed in building up your business. Formulate your prospectus, both present, and prospective financial conditions, and you will be surprised at the favorable results.

My first attempt in floating telephone securities, was a little more than three years ago. My prospectus was carefully prepared, showing eighteen per cent income on the capital invested, and from this showing, I felt no trouble would be encountered to float the bonds. When presented to a large banking and trust company by a representative agent, the head of the firm in one of our large cities seemed incensed at the audacity of an Independent telephone company for asking such, and proceeded to lecture him thus: "I own stock in the American Bell Telephone Company, and it will not be three years until all your Independent telephone companies will be crushed out by the Bell Telephone Company, and there will be nothing left of you."

After getting this message, I looked up the quotation of the Bell Telephone Company's stock, as then rated in the stock market, and now remember it was quoted at more than three times its face value. But a short time ago, I saw the same quoted at less than one-half that amount, in a period of about three years, while my company's stock was absolutely worth \$3 for each \$1 of the stock for which Mr. Banker refused to invest; and instead of his prophecy of being wiped out by the Bell Telephone Company I have lived to see my company expand from 220 subscribers to 2,250, in less than three and one-half years under the one system and management, as an Independent company.

In conclusion, I would say to the capitalists seeking investment, no surer or larger paying dividends of any industrials can be more than that in Independent telephone securities, and especially small plants which pay from fifteen to thirty per cent on the cost of construction.

My advice to those seeking aid or capital to build up Independent exchanges is that it is much easier to secure local capital than to float bonds or stock in distant cities, unacquainted with the environments favorable for the upbuilding of an exchange and its marvelous growth.

The time has come when we should justly demand of the capitalists and financiers a favorable recognition of our securities. This claim of recognition is justly due, by reason of the fact that we can show the greatest growth of increase in development, of any other one industrial enterprise within the same time. Again, we justly claim in our magnificent achievement that of bringing within the reach of the masses, by greatly reducing the cost—that which all now concede to be an indispensable necessity.

*A paper read at the Inter-State Convention, Chicago, December 9, 10, 11.

THE TELEPHONE TRANSMITTER*

Its Early History and Its Present Status with Relation to the Berliner Patent—Past and Present.

By J. J. NATE.

THE names of those identified with the microphone, or transmitter, are Boursel, Reiss, Hughes, Hunning, Cushman, Edison, Drawbaugh, Bell, Blake, Berliner, Harrison, and others whose names I do not now recall.

First we have Charles Boursel, who said, in 1854, "I have often asked myself if the spoken word itself could not be transmitted by electricity; in a word, if what is spoken in Vienna may not be heard in Paris; it is practical in this way: Suppose that a man speaks near a movable disc, sufficiently flexible to lose none of the vibrations of the voice, and that the disc alternately makes and breaks the connection with the battery. You have at a distance another disc, which will simultaneously execute the same vibration.

Reiss, a scientist and an electrician of wide reputation, deliberately set about, a few years later, the task of producing an electrical talking machine, and it is a matter of history that if he had equipped his transmitter with an adjusting spring, so as to have obtained variable pressure of electrodes in constant contact, he would have produced a practically perfect transmitter.

Hughes, at or about the time knowledge was given to the world that a speaking telephone had been invented, and Hunning, also, began a system of experiments, using various materials, of which carbon was one, for the purpose of producing a loud speaking telephone; the first English patent to Bell, and the Hughes patent, or application, at least, are not so far a part of record in the British Patent Office. The Hughes and Hunning patents were held up in this country, because of the applications for patents on a microphone transmitter, the invention of one Emile Berliner, then in the patent office pending issue. This application also stood in Edison and Drawbaugh's way. The Edison patents were for the induction coil and the use of carbon as electrodes. The Edison transmitter was constructed of two round carbon discs, about the size of a nickel, one of hard carbon and the other of lamp black, so delicately pressed into shape that they were placed in position from sheets of paper and packed in cotton while being handled. This was a very loud speaking instrument, but the moisture from the breath would change its adjustment, so that it was really not a satisfactory transmitter for long conversations. It is quite remarkable that the Edison transmitter was produced almost simultaneously with the Gray bi-polar receiver, and that the two were in service and in operation in the city of Chicago as early as 1878.

Berliner really claims in part the very method in connection with undulatory currents or sound waves, described by Alexander Graham Bell in his telephone patents, and the description of his experiments, not claimed, however, under patent; with a liquid transmitter, suggesting mercury or other suitable material from which a varied resistance could be secured as a possible means of securing another form of speaking telephone. It may be said that he was working along the lines of variable area, but he had in mind, and so expressed himself, a condition of changeable resistance, which condition obtains to-day in all forms of battery transmitter, although the change in resistance is due to variable pressure. Bell gave to the world gratis that which Berliner has since endeavored to protect by patent.

Professor Dolbear's claims for the invention of the telephone, and his early experiments with the transmitter, would—if the models submitted and the evidence presented at the time of the Pan-American suit referred to later on, can be relied upon as true—clearly demonstrate his claim as the original inventor of the telephone.

A man by the name of Strong—whose early experiments I well remember, in talking through the water, with wires thrown into the lake from piers 200 feet apart, described—as early as 1879—his first experiments and apparatus, in some part, constituting to-day the loud speaking telephone or transmitter.

But perhaps among the early claimants for priority for the invention of the telephone, Cushman stands pre-eminently alone. About six years ago he told me the story of his discovery, and

exhibited what he represented to be the transmitter used. In the pond of water was driven an iron rod, to which was attached a wire leading off to a pole, and from there on toward Racine, Wisconsin. Mr. Cushman claimed that he built this line many years before the telephone was heard of.

In further conversation, Mr. Cushman stated that it cost him his entire fortune—over eighty thousand dollars—to defend himself against the attacks of the Bell Company; and added that since the termination of that suit he had been under pay from the Bell Company at a large salary; and asked if that did not indicate the value of the evidence which had been introduced in defense of his claims during his long litigation with the Bell Company.

Drawbaugh vs. The American Bell:—This suit was known as the Pan-American. The evidence introduced by Drawbaugh at that time, was so strong that a number of leading officers and stockholders of the Bell, parent and sub-companies, sold out their entire holdings, or practically so; among whom I may mention Mr. C. N. Fay, General Manager of the Chicago Telephone Company, and Theodore N. Vail, General Manager of the American Bell Telephone Company. Many other stockholders were no doubt influenced by the action of a man of such prominence in the telephone field, and were fortunate enough to dispose of their stock before the drop which immediately followed. It is a matter of history, however, that the suit was unexpectedly terminated in favor of the Bell Company, and its shares immediately made an advance of many points beyond its original value. This being true of the sub-companies, as well as the parent Bell. In this suit it was Justice Field, I think, who said that the evidence introduced demonstrated Drawbaugh's prior invention, and that his failure to advance his claims within the time limit prescribed by law, nullified the force of such evidence.

Will the Independent people, who have invested millions in an opposition movement, for the dual purpose of affording the people satisfactory telephone service at immensely reduced rates, and benefiting the different sections of our country locally from the revenues received, turn over to the Bell Company these grand properties, through any combination looking to the downfall of the Independents, unless compelled to do so through an unqualified adjudication of the Berliner patent in the court of last resort, favorable to the Bell monopoly.

The Independent companies should work together in harmony, to the common protection of their combined interests, and the benefits which accrue to the telephone subscriber and investor throughout the country; and it is through the medium of such a convention as that which we are now holding in Chicago, that these interests are more and more impressed on the minds of the thoughtful, strengthening the weak, and drawing into this enterprise men of affairs, who fearlessly back up their faith in the movement by heavy investments, and a deep interest in a business, which only a few years ago was totally without attraction financially.

While the Bell people did much to bring the telephone into prominent use, their selfishness kept its invaluable service from those who to-day are perhaps the greatest benefactors through the Independent movement. I refer to smaller communities—towns, villages, to farmers, in the oil fields, lumber camps and mines; all of which interests, until the expiration of the Bell patent, did not know the immense value of the telephone as applied to their own necessities.

It is to be assumed that with a complete control of the field, the Bell people's rates will in some part be prohibitive to these interests, and that under such a condition the present extended use of the telephone in the Independent field will be very materially reduced. Let the Independent people stand shoulder to shoulder, fight earnestly and honestly, avoid petty jealousies and controversies, eliminating in the work of organization those elements which are born of speculation, and which reap in the beginning a large portion of the profits which should come to the owners of the plant. An honest representation of facts to a possible investor in telephone properties, and the work performed

*Abstract of paper read at Inter-State Convention, Chicago, December 9, 10, 11.

by reputable promoters, is of unquestioned value. The work these men perform in the field cannot be over-estimated. It is to be borne in mind at the same time, however, that in this business, as in every other, there are unprincipled organizers and promoters, and these are the thorns in our side, which hurt the establishment of Independent telephone properties.

About a year or so previous to the invention of the Bell telephone, Professor Elisha Gray delivered a lecture at McCormick's Music Hall in this city, illustrating his musical telephone. This instrument was connected by wire with Milwaukee, where a receiving instrument reproduced accurately musical sounds, actuated by the sending instrument at the Chicago end. These instruments were composed of metal or musical reeds, each one of a different tone pitch, and were vibrated electrically.

During Professor Gray's lecture he made a statement to the effect that his experiments while developing the musical telephone, had convinced him that it was possible to construct an instrument by which articulate speech could be conveyed electrically, and that it was his intention to shortly bring out and exploit such a device; and in a general way outlined so truthfully his theory, that when his caveat was filed in Washington—a few moments after that of Professor Bell—his claims did not differ materially from his description of many months before.

At the time of the historical fight for supremacy between the Bell Company of Massachusetts, and the Western Union Telegraph Company, the evidence presented by the Western Union Company was of such character that a halt was called, and later a compromise contract closed, by which the Western Union Company realized large profits during the life of the Bell patent, and, I have understood, in which Professor Gray shared in the payment of an agreed sum at the same time. One of the strong cards played by the Bell Company at that time, was a letter written by Professor Gray to Professor Bell, which was lithographed. Copies of this letter were sent to sub-licensees of the Bell Company throughout the country. Its contents, in a general way, were congratulatory to Bell, and one clause was to the effect that he—Professor Gray—did not claim that his statements to the effect that he was going to invent a speaking telephone, and his description of its possible makeup, constituted invention.

Of recent years much controversy has passed—directly or indirectly—between parties interested in the Bell invention, as to whether Gray or Bell was entitled to priority. From my recollection of earlier experiences, I should say that Gray—who simply delayed the matter of bringing out his telephone, through press of other interests, and who as an electrician and inventor of marked ability, coupled with some preliminary experiments which he must have made at that time, may be considered the inventor of the telephone. He certainly possessed prior claims to those of Bell, whose discovery was accidental—as the world knows.

Professor Bell was working to produce an instrument which would assist the deaf, and it is said that in his experiments he stationed a man in a distant building at the end of a wire, to tell him whether sounds could be heard at a distance. His words were understood, and the listener came hurriedly up to the Professor and asked him if he had used certain terms. The experiment was then repeated, and Bell had discovered the speaking telephone which he afterward patented. We may assume that previous to this Elisha Gray had talked from one end of his factory to the other, to say the least. It is worthy of note, too, that of the apparatus produced, the Gray apparatus was on the market almost simultaneously with the Bell, and was more practical, efficient and workmanlike in every way.

I had occasion recently, in addressing the convention of Railway Telegraph Superintendents, to cite another early use of the transmitter. Mr. H. H. Beebe, of Plattville, Wisconsin, who was an operator there at the time, had a short telegraph wire between his house and the depot. He had taught his wife the Morse code, and the line was frequently in use. When the announcement of Bell's invention was made, Beebe—who was of a very inventive turn of mind—designed a very crude telephone. It was not very clear, and in his endeavor to produce an instrument of stronger carrying power, he constructed practically the Blake transmitter. I saw the instrument, and must say that it is one of the crudest contrivances of its kind I ever examined. It is made out of a block of wood with the diaphragm fastened across the front, in back of which is an opening in the wood. In this opening, and against the diaphragm, were suspended the two electrodes.

Shortly after, Mr. Beebe constructed a line to Lancaster, on

which he installed instruments of his own manufacture. It was over this line that President Grant talked by telephone, probably for the first time in his life.

My visit to Mr. Beebe, after ascertaining from his brother that this contrivance had been used, was to procure proof which might be used in the then pending Berliner litigation; but Mr. Beebe's memory of the exact dates was not sufficiently clear to make the evidence available. Here in his case—accepting his statement as correct—we have another evidence of the Bell Company's taking care of an interest which they probably feared. In other words, Mr. Beebe continued to own and operate the line between Plattville and Lancaster, collecting tolls therefrom, during all these past years, and I am not sure but what he also owned quite a number of telephones in operation in Plattville.

Coming now to Berliner, a brief description pertaining to his invention, application for patent, and consequent litigation, in view of all that has been said and written, will be all-sufficient. Berliner's application, and the original drawings shown in his application of November 2, 1880, are the same as those shown and described in his patent of November 17, 1891. In fact, this is practically true of his British patent No. 91, granted in 1880. Other patents were also granted to Berliner in France, in 1880, 1883, 1884 and 1886, all of which have expired, and which cover every essential point under his American patent, and in view of the decision of the Supreme Court in the Bate refrigerator case, March 4, 1895, his American patents can hardly be considered other than null and void.

Coming now to the similarity of the claims covering his applications, it will only be necessary to cite one or two, for the purpose of illustration. It will be noted that, aside from the phraseology employed, his claims are practically the same. Take, for instance, Claim 1 of the United States patent of 1880. He herein described a method of producing sound variations in a plate, by causing a varying electric current to pass to the plate, or to the electrodes connected therewith, and from a second electrode in contact therewith, substantially as described.

In his patent of 1891, or the patent under appeal, Claim 1 reads: Method of producing in a circuit electric undulations similar in form to sound waves, by causing the sound waves to vary the pressure between the electrodes in constant contact, so as to strengthen and weaken the contact and thereby increase and diminish the resistance of the circuit.

In his first patent it will be noted that the word "constant" does not occur in referring to the electrodes in contact.

In his British patent of 1880, expired, we have the complete description of a transmitter, as in claim 5: A microphone or contact telephone, having only one contact affected by sound waves, and consisting of two electrodes in contact with one another, which contact is varied during the transmission of sounds by the variation in pressure upon such contact, of a pendulous weight, which is kept out of its point of rest by the interposition of the set of electrodes, and is supported in such manner that there is no lateral movement or pressure between the electrodes.

Claim 2 of his United States patent of 1880 reads: "An apparatus for producing sound by means of a varying electric current which consists of a plate forming or carrying an electrode, placed in contact with another electrode, from one to another of which the electric current is caused to pass."

In his United States patent of 1891, claim 2 reads: "An electric speaking telephone transmitter operated by sound waves and consisting of a plate sensitive to said sound waves, electrodes in constant contact with each other forming a part of the circuit which includes a battery or other source of electric energy, and adapted to increase and decrease the resistance of an electric circuit by the variations in pressure between them, caused by the vibrational movement of said sensitive plate."

The scheme on the part of the Bell Company seems to have been a disposition to patent a method, principle or function; and in order to bring about this result the first application was withdrawn, and only a part of the same returned to the patent office promptly. I have heard it stated that the original specifications were so poorly drawn as to be hardly explanatory, conveying much less than the amended claims of his second application. The claims of the second application, and the subject matter covered therein, are handled in a masterly manner, demonstrating in the broadness of their intent the work of some one thoroughly conversant with the Bell Company's methods at that time. The phraseology employed in the second application, while not materially differing from the claims of the first patent, was very subtle in its intent; and it would seem as if the claims of the

second application were based on Edison's inventions, and which owing to his connection with the Western Union at that time, and existing contracts, were probably passed to the Bell Company for consideration. In any event, as stated before, the Edison patents were early patented abroad, a description of which is reported to have appeared in Eastern papers at that time.

It is pretty well understood just what a patent may be granted for, and stress is laid upon the fact that a patent cannot be granted for a principle, function or abstract effect of a machine, but only for the machine itself. Further, if a foreign patent has been previously granted for an invention, the United States patent is limited to expire with the foreign patent, provided the termination of the latter does not exceed seventeen years.

The delay in the patent office, pending the issue of the Berliner patent, no doubt held up all other applications—Drawbaugh, Hughes, Edison, and many others. These were all contingent on the final result.

It was during President Harrison's administration that his attention was called to the number of years that the patent had been held back from issue, and he instructed that an investigation be made; the result of which was that a suit was instituted by the Government, for the purpose of annulling the patent in question. Judge Carpenter in his decision, rendered in 1895, in one of the most scorching opinions ever delivered, stated that fraud had been clearly proven, and ordered the Bell Company to surrender the patent for cancellation, because of the fraud. The Bell Company appealed from the decision of Judge Carpenter on technical grounds. The Circuit Court of Appeals and the Supreme Court reversed Judge Carpenter's decision, leaving the patent in exactly the same position as before.

Without tending in any way to cast reflection upon such an honorable body as the Supreme Court of the United States, or any of its members individually, the experiences in life prove beyond all question of peradventure that even the greatest are liable to error in judgment, and it is possible that the Independent telephone interests have suffered somewhat from the action of the higher courts in their reversal of Judge Carpenter's opinion. Why not?

I think I am correct in stating that it was some time during the early litigation that the National Telephone Company and the Century Telephone Company were sued for infringement by the American Bell Telephone Company under the Berliner patent. As the pressure of this litigation grew stronger, Mr. Leatherbee, of the National Telephone Company, sent out letters to various telephone manufacturers and others, soliciting financial aid, and I remember that in the letter, which I read, he stated that their company had already expended something like \$4,000, and had practically reached the end of their rope. Some controversy occurred at that time relative to Mr. Leatherbee's good faith. Shortly following, the National Telephone Association was organized, and at its second meeting in Detroit, when officers were elected for the following year, it was determined that by some means money should be forthcoming for the purpose of assisting the National Company through this litigation. The money required, to a very large extent, was forthcoming. It was deemed advisable, however, at that time, not to implicate the National Association in any way, and I presume the contributions made toward this fund were of a private character. In view of the amount of money subscribed, and the wide financial interest which the Independent people held, Mr. Leatherbee was asked to allow counsel to be selected by the contributors to direct the case. This, I have been told, he refused to do, claiming that Judge Payson had worked long and earnestly in their interest, and it would be an injustice to him to allow other counsel to predominate throughout the litigation then pending. Still, he appreciated the assistance which had come to him at this time, and advocated a co-operation, stating that counsel under these conditions would be gladly accepted. The result of all this was that Judge Taylor assisted Judge Payson for the defense, in the suit of the Bell versus The National Telephone Companies.

The result of the hard fought battle in Judge Brown's court is of such recent date that it need not be discussed at any length.

The court says: "I find the Berliner patent invalid, because at the date of the application, June 4, 1877, Berliner had not made the invention covered by the patent issued to the American Bell Telephone Company, November 17, 1891."

It is not necessary to call extended attention to Judge Brown's decision, a reprint of which can be found in its entirety in the

electrical papers of March, 1901. The conclusion of the Honorable Court's opinion takes us back, however, to the work of others who were even prior to Berliner in developing an instrument for the transmission of speech, which would be louder and broader in its effect than the telephone.

The Court says: "The patent does not disclose or suggest any material other than metal or metallic electrodes, and it is not proven that the metallic electrodes are generally suitable for practical use in a speech transmitter. The Court holds that the conception of Edison, of the use of carbon for speech transmission, preceded Berliner's conception of the use of solid metal electrodes, and that from his first conception Edison diligently proceeded upon a line of experiments that led to an invention of remarkable character, which borrows nothing from Berliner and has no substantial resemblance to what is shown in the Berliner patent, and cannot be identified with it by any ingenious use of language."

Still, in the face of this strong, reasonable and wise judgment, the American Bell Telephone Company, on application, was granted an appeal to the Circuit Court of Appeals, where the case is now pending, and from which Honorable Court I understand we can look for a decision in the very near future.

Is it possible, in the face of the evidence presented, and the absolute proof of what had preceded Berliner, that any Court can or will, in its wise judgment, reverse the opinion of Judge Brown? We must, of course, appreciate that the influence of the Bell Company, no matter of what character, has ever been so great that until the advent of the Independent telephone movement, with the expiration of the Bell patent, it overcame every obstacle in its path. Not only was it strong in its own home, but also at Washington, in the Patent Office and the Supreme Court, where—it will be remembered—in the Government suit for annulment of the patent, two of the Supreme Court Judges, for personal reasons, thought that it would be unwise for them to sit in judgment—thus losing to the rights of the common people in a case of such vital importance their judgment of questions involved, and which judgment might have sustained Judge Carpenter in his decision.

Should the Circuit Court of Appeals reverse Judge Brown's decision, the patent is then in full force, and only the Supreme Court of the United States can determine the rights of either party. Will they elect to do this on technical grounds, or in the common interests of the people, is a matter to be determined. My understanding is that the Circuit Court of Appeals is the final court in patent litigation, other than on those points mentioned. Technical differences will unquestionably occur should the Circuit Court of Appeals differ from Judge Brown in his judgment of the rights of the defense. And should the Supreme Court of the United States sustain the Circuit Court of Appeals in their reversal of Judge Brown's opinion, then the Independent telephone companies can shut up shop for the period of time between the rendering of that decision and the expiration of the Berliner patent, unless the verdict of the honorable court be so modified that this unfortunate condition can be obviated. If the decision rendered is without let or hindrance, the Independent telephone people may be possibly allowed to continue in business by the Bell Company on some equitable arrangement as to rentals, royalties, and matters of like character. If this condition were possible, I doubt if the Independent properties would realize enough financially to make the fight worth while; and we can safely assume, from the experiences which we have had with this gigantic competitor in the past, that there will be no mercy shown in the future.

As one of the many who have watched the Berliner patent situation from the first, and who is reasonably conversant with its various phases, I do not believe it possible, in the light of the evidence presented, and the immense values of the properties owned by the Independent telephone people, representing not speculation, but investment, employing apparatus of the very latest and most modern design, protected by patents, and—in the opinion of eminent legal talent throughout the United States—non-infringing, not only as to the Berliner, but other prominent patents, and the full knowledge of the early state of the art, which must come to the Court in reviewing the records, I do not believe that, in view of all this the Court can see its way clear to further building up the immense properties which the Bell people have amassed through the monopolistic control of a few patents, which in the light of latter-day decisions along other lines, would have been materially modified before being issued.

RESTRICTIONS BY MUNICIPAL AUTHORITY AND SYNOPSIS OF THE LAW OF OHIO*

By W. F. LAUBACH

A TELEPHONE company legally organized under the laws of the State of Ohio, and we are next face to face with a town or city council, or board of commissioners, or what is more unfortunate perhaps in some of our cities, both council and board of commissioners, whose good graces must be implored and an ordinance of franchises passed by a majority of the membership of such body or bodies. This process must be repeated twice after the first reading, and at separate meetings (unless the rules be suspended), before the ordinance becomes law.

Securing franchises for an "Independent" telephone company has always required time and the expenditure of the best energy of all concerned. Public sentiment, especially in our large cities, has long been in favor of the Independent telephone. It is the only defense a long-suffering people has found against the intolerant insolence of managers, inferior service (the result of antiquated equipment), and in many instances a perversion of law and the defiance of private and corporate rights indulged in by those who have attempted to monopolize the field.

A franchise once granted and accepted by an operating company, if it be framed in harmony with the statutes, becomes a most stubborn and obstinate matter in case pruning of objectionable features might be desirable. We here quote from the opinion of a circuit judge: "It seems to us manifest that it is, and it certainly should be, the law that the right to decide as to the use of the streets of a city by corporations of this character should be entrusted to the municipal authorities under such reasonable regulations as they may prescribe."

Let us briefly refer to some of the provisions in franchises which are at least *dangerously near* the illegal. One of the most frequent, perhaps, is the clause wherein the telephone company agrees to furnish a certain number of free telephones for the use of the city and county officials.

Franchises have been accepted embodying such clauses because of the conditions the Independent telephone companies have had to cope with.

Now, listen to what we may style the caresses of one of our celebrated jurists. It covers a number of points of vital concern to telephone men. The learned judge says: "Without stating the issues which are sufficiently familiar to council, we proceed at once to the question whether, under the testimony herein, the relator (the city) is entitled to the relief sought.

"The contract under which the company has occupied and used the streets, etc., of the city has expired, and for two years past negotiations have been pending between the city and the company looking to an extension or renewal of the franchise, but thus far no agreement has been reached.

"An ordinance renewing the franchise was submitted to the council by the board of city affairs with the recommendation that it be passed. It was referred to the committee on law in conjunction with a special committee. This joint committee reported back the ordinance, recommending amendments. Subsequently said ordinance was recommitted. The joint committee again reported back the ordinance with certain amendments, and said report was adopted. Subsequently said amendments were agreed to and the ordinance as amended was passed and referred to the board of city affairs for approval.

"No action having been taken by the board of city affairs, that body, on June 26th, was requested by the council 'to either concur in the telephone ordinance or return the same to council,' and again, on November 13th, a resolution was adopted by the council requesting the board of city affairs to return said ordinance for consideration by this body before any final action was taken by the board."

"November 27th said ordinance (having been returned to council on the 25th of November) was referred again to said committee on law and said special committee, where, so far as we know, it still reposes.

"The testimony shows that, pending these negotiations, interviews were had between members of the council and representatives of the telephone company, in which the latter declared that the company would not assent to the ordinance proposed, the objection being the fixing therein of the rentals to be charged the patrons of the company for the use of its instruments, and this is urged as evidence of the refusal of the company to come to an agreement in the premises.

"This provision was a violation of the last clause of Section No. 3461 above quoted, which declares that 'nothing in this section shall be so construed as to authorize any municipal corporation to demand or receive any compensation for the use of a street, alley or public way beyond what may be necessary to restore the pavement to its former state of usefulness.' This was an attempt to secure indirectly a benefit, which it cannot directly demand or receive.

"Again, it is shown that during the period covered by the contract the city used and still uses a larger number of the company's poles for its police and fire department wires and that it has in use, free of charge for rental or service, about eight of the company's instruments.

"Is the city in a position, under such a showing, to demand that the company shall be ousted from the use and occupancy of the street, and that it shall remove its plant, representing an enormous investment, and thus deprive the public of the advantage of telephone service, merely because the company declines to assent to an illegal condition?

In reference to crossing over or under leads of other companies, Section 3458 states, in part: "And no such company shall erect poles, piers, abutments, wires or other necessary fixtures in such close proximity to any other line of magnetic telegraph authorized by law to be constructed as to interfere mechanically with the practical working of such telegraph."

These quotations from a few of the many sections relative to what may be termed a mode for the construction of country lines especially will suffice for our present purpose. The simple and seemingly comprehensive language of these statutes would seem to grant to a telephone company unlimited rights upon the public highway so long as wires were sufficiently high.

It will be well to remember, however, that highways were originally created for the convenience of public travel by the appropriation of property from the adjoining or abutting property, and such property holder has the right to a fee therefrom when used for other purposes than that of public travel. The following quotation from one of our celebrated Ohio circuit judges is very pertinent at this juncture: "Every grant in derogation of the right of the public in the free and unobstructed use of the streets or restrictive of the control of the proper agencies of the municipal bodies over them or of the legitimate exercise of their powers in the public interest will be construed strictly against the grantee and liberally in favor of the public and never extended beyond its expressed terms when not indispensable to give effect to the grant."

We now come to the operative stage. It may be well for us to know that there are restrictions also in the matter of handling messages. We here quote Section 3462: "Every company incorporated or unincorporated operating a telegraph (or telephone) line in this State shall receive dispatches from and for other telegraph (or telephone) lines and from and for any individual, and on payment of its usual charges for transmitting dispatches, as established by the rules and regulations of the company, shall transmit the same with impartiality and good faith."

The following is quoted from the statutes in regard to taxation: "In the case of telegraph and telephone companies, the entire gross receipts for the year then next preceding the 1st day of May, from whatever source derived, whether message, telephone tolls, rentals or otherwise, for business done within this State, of each office within this State, and the total gross receipts of the company for such period in Ohio from business done within Ohio."

*Abstract of paper read at Inter-State Convention, Chicago, December 9, 10, 11.

POLE LINE CONSTRUCTION—ARTICLE III

SPECIFICATIONS FOR CONSTRUCTION

By J. W. LATTIG, General Superintendent of the United Telephone and Telegraph Company, Philadelphia.

ROAD CROSSINGS.—No wires or fixtures to the pole shall have a height of less than 18 feet from crown of the road. Along railroad rights of way no wires or attachments to a pole shall cross railroad tracks except at a height of 25 feet or higher above the rails. All poles must extend at least 24 feet above the surface of the ground.

FITTING OF CROSS-ARMS.—The braces shall be attached to the cross-arm by means of the 4-inch galvanized iron carriage bolts. A washer shall be placed next to the head of the bolt, and the bolt is to be driven into the cross-arm from the back, so as to allow the washer to rest in contact with the cross-arm.

FITTING OF POLES.—The top of the pole shall be roofed, as shown in Fig. 27. Each pole shall have four gains, $4\frac{1}{4}$ inches wide and $\frac{1}{2}$ -inch deep, spaced 24 inches on centers. The center of the upper gain shall be 10 inches from the apex of the pole roof.

A $\frac{3}{8}$ -inch hole shall be bored through the center of each gain at the time the cross-arm is placed in position. In fastening the

The tops of the poles and all gains shall be painted with one thick coat of metallic paint, mixed in the ratio of 7 pounds of dry paint to 1 gallon of pure linseed oil.

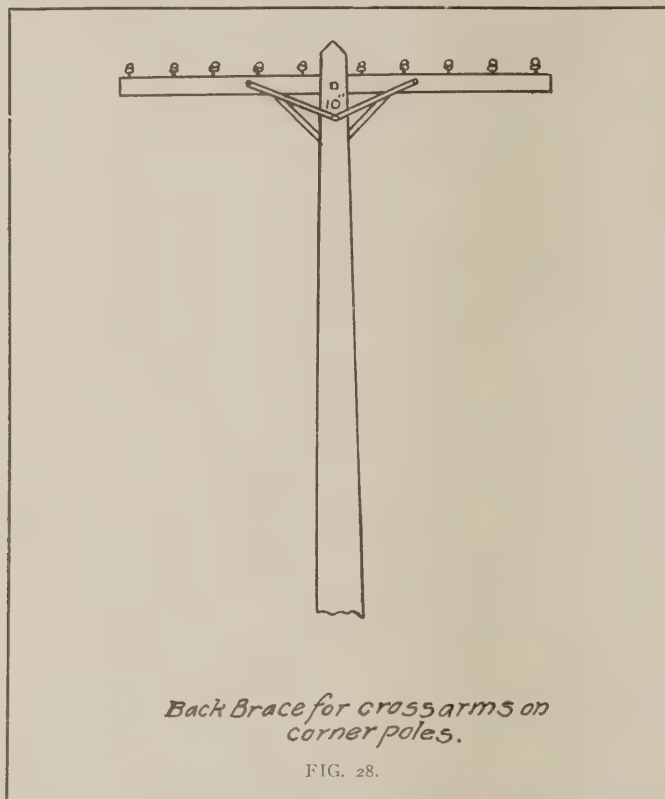
POLE SETTING.—All poles shall be set in the ground to the following depth: Thirty-foot poles, $5\frac{1}{2}$ feet on straight lines, and 6 feet on corners; 35-foot poles, 6 feet; 40-foot poles, 6 feet; 45-foot poles, $6\frac{1}{2}$ feet; 50-foot poles, 7 feet, and all poles shall be set perpendicularly.

All holes shall be dug large enough to admit the pole without stabbing or hewing, and shall be full size at the bottom so as to permit the use of iron tampers.

After the pole is placed in position, only one shovel shall be used in filling the hole completely. Three tampers shall be employed to pack in the filling continuously until the hole is completely filled. Soil is then to be piled up above the surface and firmly packed around the hole.

In filling in around the poles use the coarse gravel at the top of the hole.

ARTIFICIAL POLE FOUNDATION.—When the ground is soft so as to prevent tamping, follow the specifications for such construction best suited to the condition. These are shown in



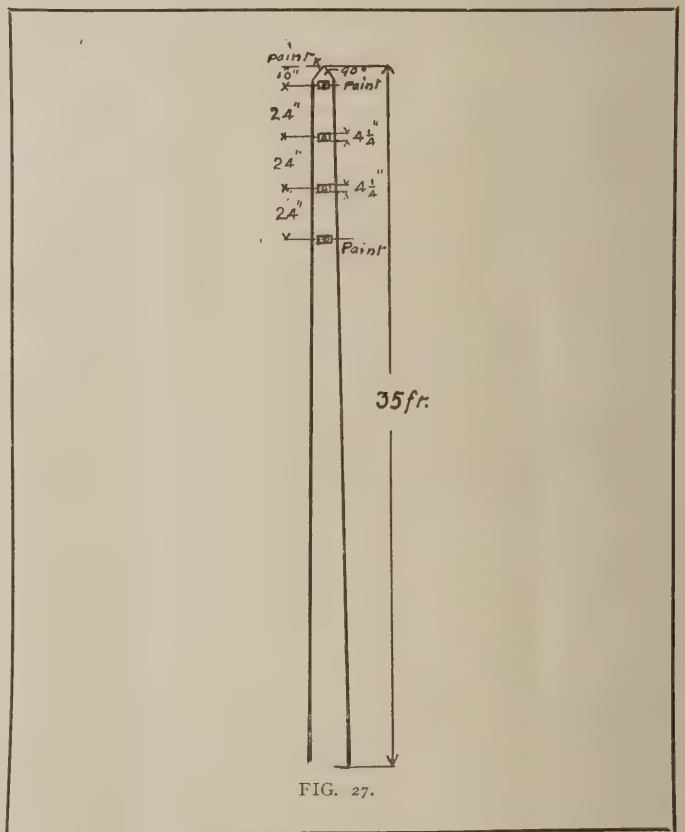
cross-arm in position the bolt shall be driven through from the back of the pole, a washer being placed under the head. A washer shall also be placed on the cross-arm under the nut.

Cable poles, office poles, all painted poles, and in cities all poles exceeding 50 feet in length shall be equipped with galvanized iron pole steps. These pole steps are to be driven alternately on each side of the pole on line with the cross-arms. If the pole is less than 62 inches in circumference the pole steps shall be spaced 18 inches on centers. If the pole exceeds 63 inches in circumference the pole steps shall be spaced 12 inches on centers.

Lightning rods of No. 6 iron wire shall be attached to every tenth pole by galvanized steel staples, spaced 2 feet apart. The rod shall extend from the top of the pole to, and have two hand-turns under, the bottom of the pole.

On corner poles, at road crossings and other places where the line makes an angle of over thirty degrees, two cross-arm braces shall be fastened to the cross-arm from the back of the pole, as shown in Fig. 28. The braces shall be fastened to the back of the poles, 10 inches below the bolt, with a 5-inch galvanized fender drive screw, and to the cross-arm by 4-inch galvanized carriage bolts.

EDITOR'S NOTE.—The first article on this subject appeared November 22. Others will follow.



Figures 25, 26, 30, 31, 32, 33. On curves, in soft ground, the poles may be braced, as shown in Figs. 29, 30, using the one brace or both braces, according to the nature of the soil and conditions. When extraordinary conditions exist, consult the superintendent.

GUY STUB SETTING.—All guy stubs shall be set in the ground to a depth of six feet. The stubs shall be set so as to lean away from the pole.

ANCHOR SETTING.—The excavation of the anchor logs shall be firmly anchored by covering it with planks, logs, or rocks as shown in Fig. 35.

When, on account of the nature of the ground, it becomes difficult to obtain an excavation 6 feet deep, one of the following methods may be used: In every case make the deepest excavation possible.

Excavations five feet deep. The anchor log may be five feet long and sixteen inches in diameter, or eight feet long and ten inches in diameter.

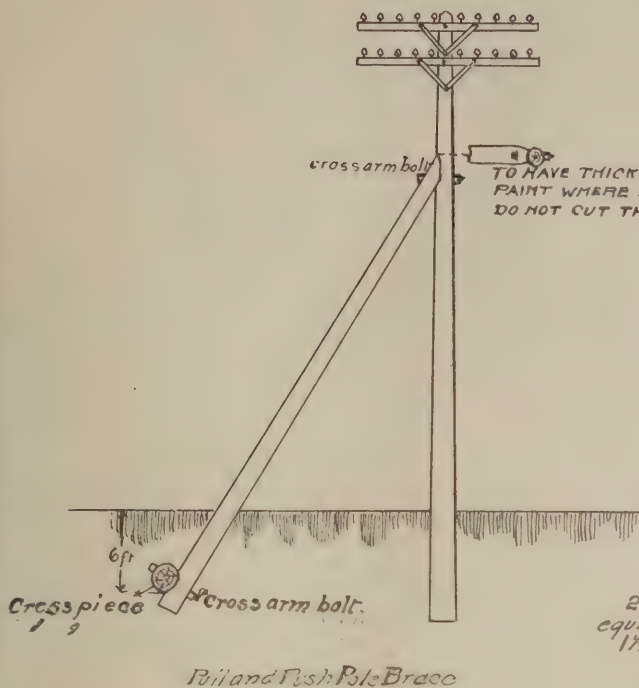


FIG. 29.

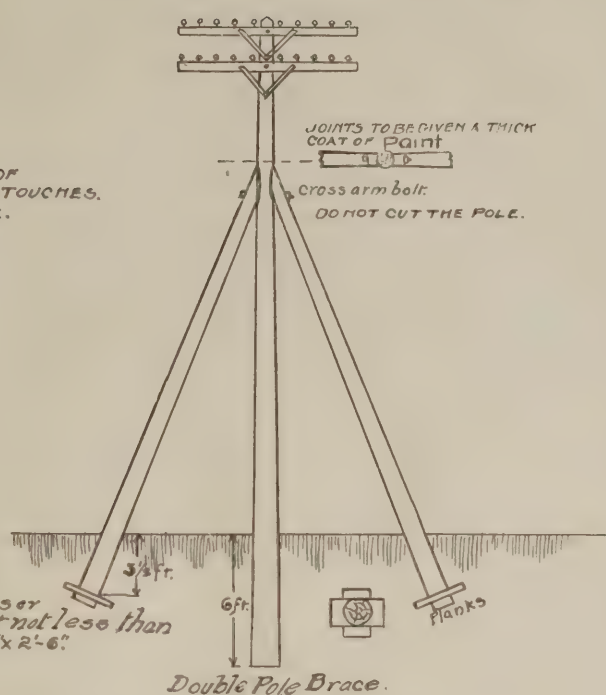


FIG. 30.

Excavations four feet deep. The anchor log may be five feet long and 23 inches in diameter. The anchor log may be 10 feet long and 12 inches in diameter.

When logs of large circumference (use no logs less than 10 inches in diameter) are not available, cross pieces may be laid across the anchor, such cross pieces being twice as long as the diameters given above.

SPECIAL FIXTURES.—When the right of way permits, "A" fix-

tures, as shown in Fig. 25, may be used, where the ground is soft.

BRIDGE FIXTURES.—Submit all plans for bridge fixtures to the chief engineer for approval before completion.

FACING OF CROSS ARMS.—On straight lines where the distance between the pole is equal, the cross-arm shall be placed on alternate sides of the pole.

On long sections, the cross-arms of the terminal poles shall be placed on the side of the pole opposite to the long section.

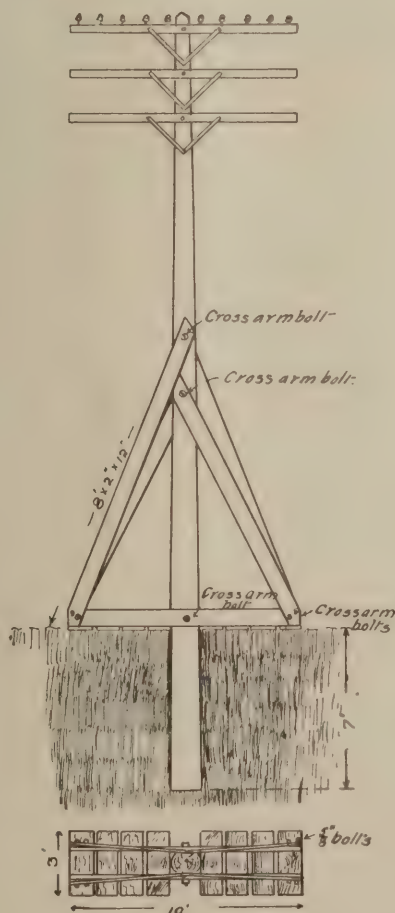


FIG. 31.

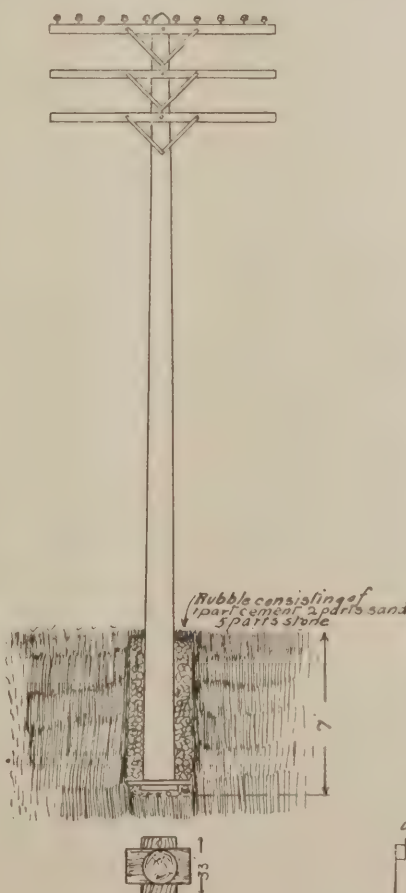


FIG. 32.

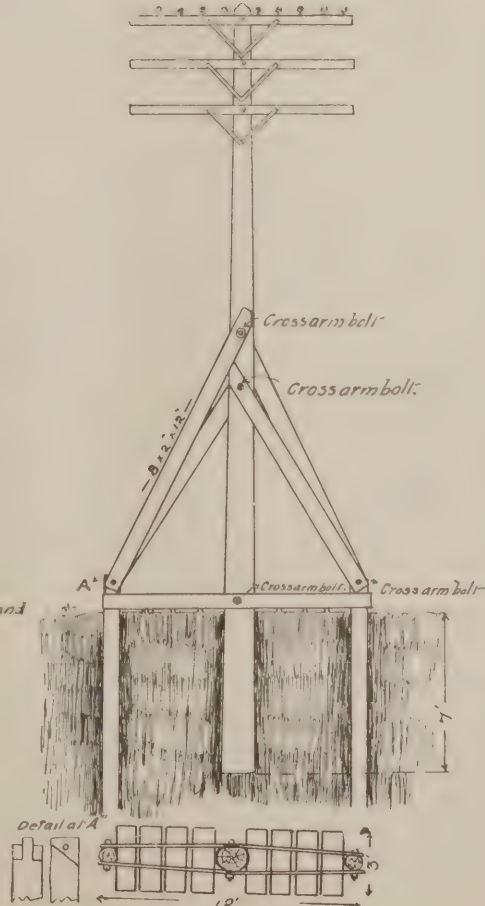


FIG. 33.

FOREIGN CURRENTS

By The Arrestor.

THE progress up to date of the Post Office telephone system in London is summarized by a report recently given by the Postmaster General in answer to a question in the House of Commons. Seven exchanges have been opened since March 1st of this year, which served districts including more than half the previous telephone subscribers, and four other exchanges are well on their way to completion. The demand for connections, however, is increasing so rapidly that it is impossible to name a date when the system will be regarded as complete. The authorized expenditure on the works, which is roughly about \$6,310,000, not only provided for the service of existing subscribers, but to a much greater extent for future requirements. The number of subscribers connected on November 15 was 5,160, and the weekly increase was from 150 to 200 stations. Up to November 15, the revenue from the London local service was \$172,365 and \$5,430 for long distance calls.

* * *

Sir William Preece in an address before the Society of Arts, on taking the presidential chair for the second year took for his theme the "science of business." He showed that by plotting the various chief financial features of a business, such as the capital expenditure, the gross revenue, the working expenses and the net profits, on curves extending over a number of years, certain indications were obtained from which general laws could be deduced constituting a "science of business." From curves thus prepared illustrating the course of a business over several years, forecasts might be made as to the future course of the business and measures taken to avert loss or failure. Sir William illustrated his theory by numerous diagrams showing the actual results achieved by electric light, railway and telegraph concerns. Of the telephone he spoke as follows: "The telephone business of this country defies diagrammatic analysis. It has had a curse upon it from its first introduction. It is now in a state of chaotic confusion. It has been the shuttlecock of politicians and the football of local authorities. The attempt to force it upon the municipalities is likely to prove a failure. Tunbridge Wells has lamentably broken down. It is an Imperial business, a part and parcel of the business of the Post Office, and the only possible solution of the present deadlock is for the government to cut the Gordian knot and take over the business in 1911."

* * *

These be hard words and Sir William Preece must evidently feel deeply on the subject of telephony so to mix his metaphors and confuse his statements. How a thing can be at once a shuttlecock and a football is not very clear unless it is meant to imply that politicians so tower over local authorities that a football to the latter becomes a shuttlecock to the former. It is true, however, that the muddling action of both politicians and local authorities has greatly impeded the development of telephony in Great Britain. But that telephony is an Imperial business is a proposition that no telephone man can agree to. The telephone has been best developed precisely in those places where it is not an Imperial business, and the real curse upon the telephone in Great Britain has been the government monopoly. If ever a business needed "free trade" and unrestricted conditions for development it is that of the telephone. Finally, how can "the present deadlock" be solved by the Government taking over the business in 1911, nine years hence?

* * *

As may be judged from the paragraph above, the Post Office is spending a large amount of money on its London system, but it is getting a good modern telephone plant for that money. An article in the *Electrician* describes two of the new Post Office exchanges, which are equipped with central energy system having all the latest improvements such as meters, selective party-line ringing-keys and machine ringing-keys. The party-line ringing arrangement gives selective ringing for four stations on a line. Each instrument is provided with an alternating current relay which legs the bell to earth on one side of the line. Each side of the line carries a plus and a minus bell, thus

giving four combinations. The relay circuit is broken and the bell cut out when the subscriber takes his receiver off the hook.

* * *

The two new exchanges are each designed for an ultimate capacity of 5,400 lines, and have a present equipment of 1,000 lines. The drawings show that each operator's position has 180 answering jacks and eighteen pairs of cords, so apparently the traffic of the London subscriber is not very large. The incoming trunk positions have twenty-six trunk lines each, and on each board there are three operator's positions to a section. The ringing keys on the incoming trunk positions are individual keys for each line, but on the subscriber's sections a single key does the work for all the cords. This key is a four-way key mounted on a sort of ball-and-socket joint so that it may be pushed over to each of four positions, acting on a different set of springs in each position, so as to make the required connection of plus or minus current to either leg of the circuit. In order to connect the general ringing key to the particular cord on which ringing is to be done the corresponding combination ringing and listening key must be pressed at the same time. This strikes one as an ingenious and economical arrangement.

* * *

The projected sale of the Tunbridge Wells municipal telephone system to the National Telephone Company is still the reigning telephonic topic of interest in England. The proposed sale has aroused a storm of opposition among those interested in municipal telephony in other cities, and there is also a strong local sentiment against the sale in Tunbridge Wells itself, although the Town Council voted for it by 19 to 8. As is always the case with telephone controversies, there is a flood of sentimental and ignorant talk being poured out and the real facts of the case are in danger of being buried out of sight or distorted out of all recognition in the stress and turmoil of the dispute. The Postmaster-General has had to submit to three deputations on the subject, one against the sale and two for, and a meeting of municipal authorities interested in telephones has been held to formulate those resolutions of protest so dear to the heart of the aggrieved Britisher.

* * *

When the matter has been settled one way or the other it will be of some interest to pick out the real facts from the mass of discussion and controversy and see what has actually been done with the pioneer English municipal telephone system. As the matter stands now two interesting points seem to protrude themselves; that departmental management is at sea with the telephone and that telephone management generally comes out ahead in any little manoeuvres either with a municipality or with the Post Office. The municipality started to build a small system at a cost of about \$40,000, but soon found itself let in for a system costing \$125,000, and still crying for more, while the revenue does not meet the expenses. Company management would have faced the situation, changed the rates, reduced the expenses, or at least hung on until the business had had time to find itself. But municipal management throws up the sponge because it cannot make more money and cannot make the telephone system a charge on the "rates." In fact, telephone profits were expected to reduce the rates and taxes and so cheer the taxpayers.

* * *

Whether the sale goes through or not the National Telephone Company scores by the exhibition it has made of the pioneer municipal telephone system. Various notes in the English technical journals show that a certain scare has been felt by other municipalities connected with telephony. But the Postmaster-General's sanction must be obtained to the sale and the Postmaster-General has this dilemma to face. If he refuses consent he forces Tunbridge Wells to carry on a losing business, for which the Town Council has a good offer, and has voted to sell. If he gives his consent the National Telephone Company absorbs its competitor and remains in possession of a license extended for a term of fifteen years, that extension having been obtained because of the existence of competition.



The Operating Field

MAINE INDEPENDENTS GROWING.

WAY up in Maine, Independent telephone companies are just beginning to get a foot hold. The *Lewiston Journal* recently prints the following about the farmer lines: Probably no other section of this State is so well supplied with telephone lines as this section of Oxford County. There are about 150 miles of local telephone lines centering into this place so connected by a switch that a person on any of the lines can talk with whom he pleases on the different lines.

One line runs up through Woodstock, Milton, Hanover, Rumford and is now within eight miles of Rumford Falls and is expected to go through to Andover next summer. Another telephone line runs to Bryant Pond, Lock's Mills and East Bethel with money enough subscribed to run the line in the early spring to Bethel, West Bethel, Gilead and the lakes, and in all probability will go to Gorham, N. H., also to Norway, Waterford, Harrison, Greenwood, etc.

One year ago an agent of the Eastern Telephone Company entered into written agreement (for his own territory) for five years with the different local telephone lines whereby the Eastern Telephone Company could have the use of the different local lines by way of a switch at the drug store in this place and vice versa with the local lines upon agreed upon tolls, etc.

This was very satisfactory and business was moving along harmoniously when a report came from this same agent that the contracts with the local lines was not worth the paper it was written on and unless these local lines would accept the Bell transmitter and receiver at two dollars a year on their own machine, they would be disconnected.

The Oxford County Telephone Company complied with this demand, the other telephone lines feeling sensitive and feeling that there was a cat under the meal, objected to make any changes and are expecting to be disconnected any day.

A FARM TELEPHONE DECISION.

THE Wapello (Ia.) telephone case has been decided in favor of farmer telephone lines. This case attracted considerable attention because it is of importance to farmers who own rural telephone lines. Neither council for the plaintiff nor defendant were able to produce or cite similar cases from other states upon the question of whether a private telephone line was a fixture or not. Judge Smyth who rendered the decision, decided that private telephone lines including poles and wires as in this case are fixtures and therefore a part of the farm.

The contention of the plaintiffs was that they had constructed a telephone line from the residence of Noah R. Letts on the large stock farm owned by him last year to the town of Grandview and there connecting with other lines which the plaintiff claimed constituted a telephone system belong to them as co-partners. Before the departure of Mr. Letts for Chicago where he is now residing, he sold and transferred his interest in this telephone line to his co-partners Lieberknecht and Fitzsimmons, the plaintiffs in this suit. Later he sold the farm to Brockway and son, stock raisers, who now own the place without making any reservation of the line. The Brockways then sold the line now in dispute to the Louisa and Muscatine County Mutual Telephone Company, the defendants herein. The plaintiffs then attempted to enjoin the defendants from using this line. The contention of the plaintiffs among other things was that the general nature of a telephone line running from house to town was of such a character as to establish constructed notice to the

purchaser of the farm that it belonged to other parties which is analogous with the corresponding rule of railroads and telegraph lines across a farm.

The defendants insisted that the telephone line was a part of the realty and a fixture on the farm because of its permanent character and the fact that it added to the enjoyment of the place and the general business of running a farm, and therefore was a part of the realty just as much as the fences or barns were, and that a man buying a farm on which there is a private telephone line running from residence to town, is entitled to the telephone line along with the barn and house and other fixtures.

Judge Smyth by his decision rules that the telephone line from the Brockway residence up to the place, where it joined to what is called the telephone system of the plaintiffs was part of the realty and appurtenant thereto and passed to the purchaser of the farm. From that point on into town the judge decides is owned by the plaintiffs and defendants in common.

A NEW PHASE IN MICHIGAN AFFAIRS.

THOSE who have contended that when the Michigan Telephone Company took over the plant and franchises of the old Detroit Telephone Company it became legally bound to furnish telephone service through its own exchange on the terms fixed in that franchise will be deeply interested in the position taken by the Old Colony Trust Company, of Boston, in its injunction proceedings, brought on behalf of bondholders of the Michigan company, to prevent the latter from disposing of its property, says the *Detroit News*. The trust company, representing eastern holders of the bonds, formally repudiates the purchase of the Detroit Telephone Company, and will endeavor to have it set aside. There may be two reasons for this. Either the fact that the purchase itself was a losing venture and that the trust company's attorneys believe they can escape from the bargain on a technicality, or the fact that they believe the terms of the franchise are enforceable against the company that holds it, would explain their desire.

Indications favor the view that the latter is the real cause of the wish to nullify the purchase. It is several years since the Detroit company was bought out by its older rival, and this is the first intimation ever given that the bondholders objected to the transaction, or that they failed to give assent at the time the deal was put through. That it was a useless expense and a most unprofitable venture has been apparent for a long time, and silence under those circumstances favors the assumption that they had determined to accept the loss, and make the best of a bad situation, until the question of the Michigan company's responsibility under the terms of the franchise was raised.

A GOOD TELEPHONE STORY.

ACOOK, a fresh importation, who had never seen nor heard of a telephone instrument accepted an engagement in a New York suburban household. The whole thing impressed her as uncanny and for weeks she stood in awe of the apparatus, always putting on a clean apron before answering a call to and interview with some lady or gentleman at the other end of the mystic wire. One day she electrified a dozen guests at dinner by appearing at the door of the dining room and asking distractedly, of her mistress, "Is this McGinnis' grocery store?" "Why of course not, Bridget," responded the amazed hostess, "What do you mean?" "Well, shure, they asked me over the tellyphone this minnit, ma'am!"

Patents

A. F. Swan, of Bayonne, N. J., patents (No. 714,759), a telephone system. This is a new contrivance for a selective party line system. A perspective view is shown in Fig. 1. Briefly described, the apparatus consists of an electric magnet 26a, Fig. 1, to which is pivoted an arm 24 that operates a ratchet 19 upon the shaft of a cylinder 13. This cylinder carries a series of pins, which are differently situated in each of the stations on the line. The forked arm 14, provided with contacts 18 and 18a, is so

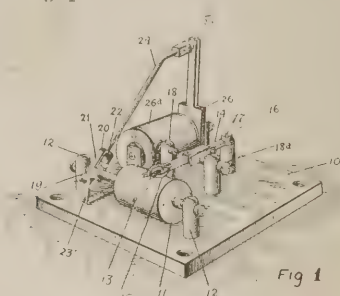


Fig 1

located as to engage with the various pins upon the cylinder. A series of impulses transmitted through the electric magnet 26a will cause the cylinder to rotate any desired number of steps. Evidently the location of the pins on the cylinder will control the position of the contacts 18 and 18a by means of the escapement arm 24.

This device acts as a selective lockout signal, for only that party can be called whose cylinder is rotated such a number of steps as will permit the escapement arm to make the contacts 18 and 18a and enable the ringing current to be sent to the ringers. It is a new modification of the familiar step-by-step motion.

E. G. Thomas, Cambridge, Mass., patents (No. 714,760), an electric annunciator drop. In this patent is shown an improved form of annunciator or electro-magneto signal. Figs. 1, 2 and 3 show the device. The electro-magnet 2 is supported on a frame 1, beneath which is a pivoted arm. From this, as an armature, is a catch 6 of such a length that when the armature is in its lowest position the catch will reach and rest upon the frame 1. Attached

FIG 1

FIG 2

FIG 3

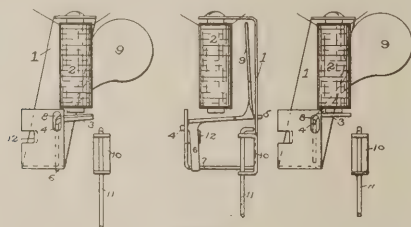
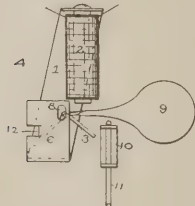


FIG 4



to the armature is the target 9 that serves as an indicator. In this invention the operation is as follows:

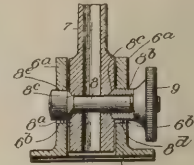
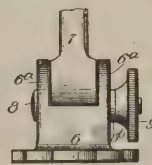
In Fig. 1 the device is shown ready to receive a signal, the circuit of the electric magnet having previously been closed, as this is a closed signal circuit. As soon as the circuit is broken the armature drops and the target 9 falls toward the position shown in Fig. 4. A set back rod 11 is provided for replacing the target in its normal position.

Charles T. Mason, of Sumter, S. C., patents (No. 714,813) a joint for telephone transmitter arms. This is an invention for an

improved base to support a transmitter arm. It is shown in Figs. 1 and 2. The chief object is to secure a pivoted arm, which may be readily adjusted by the user and at the same time to attain ease and cheapness in manufacture. This is secured by the use of the

Fig. 1.

Fig. 2.



cones at 8e and 8c. By this means the process of manufacture is made very easy, being all machine work and inexpensive.

Alfred Stromberg, of Chicago, Ill., patents (No. 715,434) and assigns to the Stromberg-Carlson Telephone Manufacturing Company an electro-magnet. The device is an improvement in switchboard relays, and is illustrated in Figs. 3 and 4. It essentially consists in making the core of the relay in two parts, one of which is adjustable in reference to the other and to the armature. By

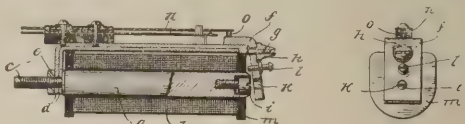


Fig 3

Fig. 4

this means, when the armature is properly adjusted, the magnetic flux may be varied by changing the movable portion of the core without interfering in any way with the movement of the armature. This is accomplished by making the end of the core A in the form of a screw I. In the armature F a hole H is drilled so that the screw may be adjusted from the exterior without affecting the armature adjustment in any respect. For relay switchboards this device has considerable merit.

Henry Baething, of Buffalo, N. Y., patents (No. 715,455) a sanitary attachment for telephone transmitters. This is an invention for improving the sanitary condition of telephone mouth-

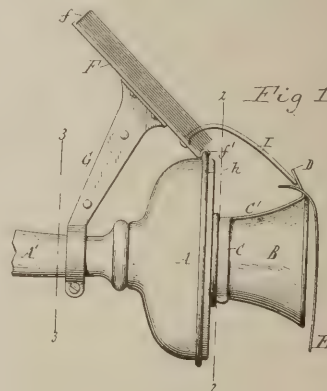
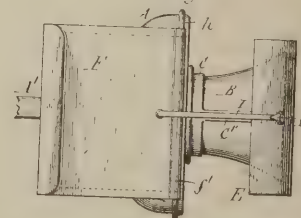


Fig 1

Fig 2.



pieces. It is shown in Figs. 3 and 4, and consists of a small receptacle F; supported over the transmitter, in which sheets of paper or other material are stored, which may from time to time be placed in front of the mouth-piece, being held in position by the clamp D, as shown in Fig. 1.



NEW COMPANIES.

SWAINSBORO, GA.—R. J. Anderson & Co., are trying to establish a telephone exchange in Swainsboro, with connections with all the nearby towns and cities.

FOREST CITY, IA.—A long distance telephone company was organized recently by some of the business men of Forest City which will be known as the Great Northern Telephone Company and articles of incorporation have been filed. The company has a capital stock of \$25,000, and will erect long distance telephone lines to surrounding towns and put in rural telephones which will be connected with the long distance ones. The circuits will be full metallic. The board of directors is as follows: J. Thompson, O. A. Olson, Willard Secor, T. Jacobs, H. R. Irish, C. J. Thompson, J. A. Peters. Officers: O. A. Olson, president; T. Jacobs, vice-president; Willard Secor, treasurer; J. A. Peters, secretary. The material to construct the lines is already ordered and work will commence at once on a line extending in a southeasterly direction to Miller.

ORWINGSVILLE, KY.—A movement, headed by some of the town's leading business men, is on foot to organize a new telephone company here, with connection with the long distance lines and lines from this place to all surrounding towns. Capital stock, \$3,000.

ST. PAUL, MINN.—The Twin City Telephone Directory Company has filed with the Secretary of State a certificate showing that \$5,000 of its capital stock had been paid in. The stockholders are J. W. Browning, E. C. Shears and F. J. Youngquist.

HAMILTON, MONT.—The Bitter Root Telephone Company has been incorporated by Matt Blindauer, Henry L. Meyers and Fred T. Lillick, all of Hamilton, with a capital stock of \$20,000.

TAMORA, NEB.—The farmers of Tamora have organized a mutual telephone company to cover the county, and the lines will be built out of that town in three directions. The lines will be twenty-seven miles long.

TRYON, N. C.—The Polk County Telephone Company has been incorporated, with headquarters at Tryon. The company is to do a general telephone business in Polk county. The capital stock is \$5,000, shares \$10 each, the company organizing with \$1,130 subscribed. The stockholders are Thos. C. Mills, Earle Grady, E. E. Missildine, F. E. Hellen, T. T. Ballenger, R. B. Engal, George A. Gash, R. F. W. Alston, of Tryon; H. E. Gray, S. W. Miller, Eliza Miller, J. G. Hughes, J. W. Newman, C. C. Hampton, J. P. Morris, J. E. Shipman, F. M. Burgess, W. C. Bostic, J. P. Arledge, N. B. Hampton, A. L. McMurray and C. C. West, of Columbus.

BAINBRIDGE, N. Y.—The Riverside Telephone Company has been organized. Alonzo Lilley is president, C. Fremont Bentley, secretary, and Christopher Toby, treasurer. The company will erect a line along the west side of the river between this village and Sidney.

BEDFORD, N. Y.—The Western Maryland and Hyndman Telephone Company, of Bedford, has been incorporated with a capital stock of \$1,500.

ASHLAND CITY, TENN.—It is said that a number of the leading business men of this place will at an early day organize a company and obtain a charter for another telephone system for this place and the territory contiguous thereto. The purpose of the new company is to have the exchange here, and have the lines extend to all points in the county and probably to Nashville, Clarksville and Springfield and all way points.

GARDEN VALLEY, TEX.—The S. P. Veasey Telephone Company, of Garden Valley, has been incorporated with a capital stock of \$3,000. Incorporators: S. P. Veasey, A. J. Nowlin, C. E. Browning and W. L. Garland.

WELLSBURG, W. VA.—The Wellsburg Telephone Company has been re-organized under the name of the Wellsburg Home Telephone Company. Henry Stengle is president, George W. Russell, secretary, and Claude Wyant, manager. They have issued \$1,500 worth of bonds, most of which has been taken in Toledo, Ohio. The company will soon extend lines to Brilliant and Wheeling.

FOOTVILLE, WIS.—The Footville Telephone Company has been incor-

porated with a capital stock of \$4,000. Incorporators: S. Jacey, A. Aspinwall and J. Meehan.

LEGAL.

ATLANTA, GA.—Judge William T. Newman, in the United States Court, has settled the terms of the decree under which a mortgage on the property of the Atlanta Standard Telephone Company is foreclosed and the property ordered sold. The hearing was had on an application made some time ago for the sale of the concern. Under the decree the property cannot be sold for less than \$200,000, this amount being fixed as the upset price. Attorney Albert Boylston was appointed commissioner to conduct the sale and the date of the sale is to be within sixty days from the signing of the decree. Each bidder on the property is required to deposit the sum of \$2,500 with the commissioner as an evidence of good faith. The purchaser, after the deal has been closed, is to pay \$25,000 in cash and the remainder as the court may direct. Judge Newman reserves the right to pass on the priority of any bondholders after the sale is made. The telephone company has been in the hands of a receiver since June, application for the receivership having been made by the bondholders. The trustees for the bondholders are represented by Attorneys King & Spalding and J. H. Gilbert. A number of the intervening bondholders are represented by Attorneys Ellis, Wimbish & Ellis, H. E. W. Palmer and Walter R. Brown. The company is represented by Attorney E. W. McGill, of Philadelphia.

MOUNT CARMEL, PA.—The failure of the Central Telephone Company to deliver a message promptly has resulted in a rather unusual suit for damages in the local courts. A valuable horse of Thomas McDonald was taken sick and from this place a message was telephoned to Dr. Longacre, a veterinary surgeon at Shenandoah. The doctor did not come and the horse died. When McDonald learned that the message, sent shortly after 1 o'clock in the afternoon was not delivered until 5 o'clock, he decided that the telephone company was responsible for the death of his horse. Suit has been brought to recover \$300. The defense was that McDonald could not prove that the presence of the veterinary surgeon would have saved the animal. The jury in the case, after having been out twenty-four hours, reported disagreement. The case was continued to the next term of court.

FINANCIAL.

FREMONT, NEB.—The Fremont Telephone Company has decided to increase its capital of \$25,000 by one-third. This additional stock is to be used exclusively in building rural lines and bringing the farming community into direct communication with Fremont.

BUFFALO, N. Y.—The Independent Union Telephone Company has voted to increase its capital stock from \$200,000 to \$1,000,000 for the purpose of connecting its Western New York properties with the Eastern and Southern New York exchanges. Samuel B. Rawson, of Elyria, Ohio, was re-elected president.

COOPERSTOWN, N. Y.—The Cooperstown Telephone Company has declared its first dividend of 3 per cent. for the past six months on its preferred stock.

BONHAM, TEXAS.—The Texas Telephone Company, of Bonham, has filed an amendment to its charter, increasing its capital stock from \$10,000 to \$100,000.

PARIS, TEXAS.—The Citizens' Telephone Company has increased its capital stock from \$120,000 to \$150,000.

RATES.

DELRAY, MICH.—The Delray Council has received a communication from the Michigan Telephone Company, notifying it that after January 1 there would be a raise in telephone rates. A resolution directing that the village attorney look up the law to ascertain just what could be done was adopted.

THE WEEK'S MESSAGES Continued

ELECTIONS.

LEWISTON, ME.—At a meeting of the stockholders of the Citizens' Telephone Line these officers were elected: President, R. L. Cummings; Dr. J. G. Littlefield, secretary, and Alfred H. Jackson, treasurer. The board of directors includes Newell Thomas, of Oxford; O. K. Clifford, of South Paris; William Caldwell, of Oxford, and Henry Records. This company is just getting its business under way. The directors have voted to use the American Electric Telephone Company instruments. There are sixty subscribers. The line runs from South Paris by way of East Oxford to Hebron and by another branch from South Paris to the King Neighborhood and thus to Paris Hill. There are about twenty miles of wire, and the lines are already being strung by a crew of linemen. The company is not yet incorporated.

WESTON, O.—The Weston Home Telephone Company, recently incorporated, has elected the following board of directors: M. Brundage, G. B. Spencer, D. E. Lashley, J. M. C. Cook and W. A. Dewese. Mr. Brundage was elected president, Dr. Spencer, treasurer.

COMBINATIONS.

JACKSON, MICH.—The Citizens' Telephone Company, of Grand Rapids, has acquired the local telephone exchange. The stockholders of the local system, the People's Telephone Company, recently held a meeting and re-elected the old officers. The directorate was increased to twelve members from eight by the election of the following gentlemen: W. J. Stuart, Grand Rapids; R. D. Graham, Grand Rapids; J. H. Feldew, St. Johns, and C. T. Babcock, of St. Johns. The name of the People's Telephone Company was changed to Citizens' Telephone Company.

NUNDA, N. Y.—The Business Men's Telephone Company, of Nunda, has been sold to the Ricker Telephone Company.

FRANCHISES.

REDLANDS, CAL.—At the sale of a telephone franchise for this city Walter M. Campbell bid \$150 and was awarded the franchise.

LE MARS, IA.—The Le Mars Telephone Company has asked for a franchise from the city for the establishment of a new telephone exchange in LeMars. The company, through its representative, J. U. Sammis, was before the council recently and presented the matter. It is understood that Eastern men are back of the enterprise.

MASON CITY, IA.—R. A. Davidson, of Waterloo, and H. A. Mason, of Chicago, representing the New Telephone Company, have applied for a franchise to install a system here. If granted, an underground system of the latest central energy design will be constructed.

REMSEN, IA.—The telephone franchise which was being sought in Remsen by the Miller-Quick Company of Sioux City, and which was submitted to the voters, has carried by a majority of nearly 4 to 1. The franchise voted on gives the company the right to establish a telephone system and exchange.

GIBSON CITY, ILL.—At a meeting of the city council the Dix Township Telephone Company was given a limited franchise to run its line into this city. The ordinance states that the poles must be a uniform height and must be kept neatly painted, that the wires must not be allowed to sag, and that no trees are to be trimmed without the supervision of both the street commissioner and the property owners. The company is to accept all messages for any 'phones on its lines and charge a uniform rate of toll in all cases. A number of other provisions are made, and the company is given thirty days in which to accept the franchise, furnishing a bond for \$1,000 in case it accepts. In case of acceptance the line is to be built, the office established, and connections made with all telephones on the system within three months. The franchise runs for a period of nineteen years, the Council reserving the right to cancel it, and in case it is transferred to another company or individual, the successor must furnish bond and agree in writing to all its provisions.

KANKAKEE, ILL.—A twenty-five-year franchise has been granted the Inter-State Independent Telephone Company by the City Council of Kankakee. The ordinance was passed without a dissenting vote. The new exchange is to be put in next year, although the company has until 1904 to complete it. The company agrees to give the city free telephones for the police and fire departments and for the city officials. This service is estimated to effect a saving of over \$500 a year to the city. The charge for telephones will be \$30 for business and \$18 for residence. The company agrees to forfeit its plant to the city if at any time during the life of its franchise it should sell its property to any competing line.

ROCKFORD, ILL.—Franchises have been granted to the Home Telephone Company and to the Boone County Co-operative Telephone Com-

pany by the board of supervisors. They are required to make a certified report on September 1 of each year and to pay the county 2 per cent. of their gross earnings. The rates are fixed at \$30 per year for single lines and \$15 for party lines, with no toll charges for subscribers.

PLEASANTON, KAN.—The City Council has granted a telephone franchise to C. R. Baldwin, of Kansas City. The exchange will be at La Cygne.

LITTLE FALLS, MINN.—S. R. Snow has asked for a telephone franchise to construct and operate a system in this city.

MANKATO, MINN.—The Minnesota Valley Telephone Company, of which Dr. J. H. James is president, has asked for a franchise to enter this city in competition with the Northwestern Telephone and Telegraph Company.

STILLWATER, MINN.—The Twin City Telephone Company has applied to the City Council for a franchise to run its wires through the business portion of the city. It is said that the intention of the company is to operate an exchange here.

YONKERS, N. Y.—The People's Telephone Company has asked the Council for a franchise to construct and operate a telephone system in this city. The company will be required to deposit a bond of \$10,000 and will construct a plant with an immediate capacity of 500 lines and ultimate 2,000. At a recent meeting of the Council, a committee was appointed to thoroughly investigate the proposed franchise and also Independent services in other cities.

NEW WILMINGTON, PA.—The Council has granted a franchise to the New Wilmington Telephone Company. No restriction is placed on rates and the company is to pay \$10 a year for its franchise.

GAINESVILLE, TEX.—After a hot fight and hard work Mr. McElroy, of Fort Worth, has succeeded in getting a franchise through the City Council for a telephone system in this city, together with long distance connections.

JEFFERSON, WIS.—A franchise has been granted to Frank P. Mansfield, of Lake Mills, Wis., by the Common Council for the construction and maintenance of a telephone exchange in the city.

UNDERGROUND.

COUNCIL BLUFFS, IA.—At the meeting of the City Council an ordinance was introduced providing for the placing of all telephone wires underground within city limits and for the removal of all telephone poles within the same area. The ordinance further provides for the use by the city of the conduits for the wires of its fire and police-alarm system. The ordinance has been referred to the committee of the whole.

NEW CASTLE, PA.—The municipal underground conduit system, which has been in process of construction here this fall, is practically completed. The conduit so far constructed has cost the city \$31,651 and covers the principal downtown business districts. It is proposed by the city to force all telephone, telegraph and electric wires underground, and the municipality expects to make the conduit investment profitable to the taxpayers by charging the various companies a sufficient toll to pay the interest on the investment. A hard fight in the courts is expected before all the wires are forced into the city conduit.

CONSTRUCTION.

FAYETTEVILLE, ARK.—The Northwest Arkansas Telephone Company will soon install twenty-five additional telephones in Fayetteville. It will construct a ten-mile toll line to Goshen next spring. In the next few months most of the cable leads and wires here will be reconstructed. This company owns the following exchanges: Rogers, 90 subscribers; Springdale, 100 subscribers; Huntsville, 25; Fayetteville, 300 subscribers; Bentonville, 100 subscribers. It operates 150 miles of toll lines. Judge M. Berry, of Springdale, Ark., is president of the company, and J. P. Deaver, of Springdale, is secretary.

NORTHWOOD, IA.—A meeting will be held at Tenold soon for the purpose of entering into an agreement by which arrangements can be made for connecting the Northwood Telephone Company with the Joice-Tenold and Kensett-Tenold lines at Tenold. Representatives of the local company will attend the meeting, confer with other interested parties and offer the most liberal terms consistent with an efficient service. It is expected that in the early spring a line will be built from Tenold to Hanlontown, and it is proposed to arrange to have that line connected as soon as it shall be completed.

FRIENDSHIP, ILL.—The directors of the Friendship Telephone Company have decided to build a toll line from Graymont to Flanagan. The line will run straight from Graymont down the Illinois Central Railroad.

PEKIN, ILL.—The enormous demand for Citizens' telephones has made it necessary for the Citizens' Telephone Company to increase its facilities.

THE WEEK'S MESSAGES Continued.

It is now installing an additional toll board and increasing the capacity of the exchange to 800 telephones.

ROCKFORD, ILL.—The Northwestern Telephone Company has submitted a proposition whereby the Home Telephone Company, of this place, will get long distance service. A representative of the Northwestern was in Belvidere recently and met with the directors of the Belvidere Home Company. He stated that it was the intention of the company to extend its lines from Aurora to Beloit, and if it does so connections with the Belvidere exchange will be made. Plans are already well under way for the connecting of the Independent exchanges of Rockford and Belvidere.

STERLING, ILL.—The Tri-State Telephone Company has commenced work on the construction of its new toll line, which is to extend from Chicago west to Clinton, Iowa, and south as far as Springfield. The line will pass through Dixon to Sterling and Clinton, from Sterling to Peoria, and from Peoria to Springfield. Connection will be made with all the smaller towns along the line. The new toll system will be under the control of the various Independent telephone companies of Northern Illinois and will be equipped with the most modern appliances obtainable. Sterling will be the distributing point of the system.

ELKHART, IND.—At a meeting of directors of the Home Telephone Company of Elkhart County at the office of Manager George H. Fister, it was decided to expend \$30,000 in improving the plant. Over 200 applications for telephones have been made, and the capacity of the plant is inadequate to meet the demand. In Goshen also the capacity is inadequate. Additional telephones and switchboards will have to be installed.

GRAND RAPIDS, MICH.—C. T. Rood, E. B. Fisher, W. J. Stuart and C. E. Tarte attended the meeting of the Calhoun County Independent Telephone Company in Battle Creek. The company now has 500 telephones in service and will install a new section of switchboard capable of providing for 125 more instruments. The toll line between Battle Creek and Marshall has been opened.

STOCKBRIDGE, MICH.—The Tamarack Telephone Company is constructing additional lines between Stockbridge and Dansville.

ALEXANDRIA, MINN.—The Interurban Telephone Company has purchased the site for the new exchange building. Work on the building will begin in the spring. Several lines will be constructed, one of which will run to Nelson and from there to Belle River.

HANNIBAL, MO.—Officials of the Bluff City Telephone Company, which is to construct a \$70,000 exchange here, held a meeting with representatives of the Adams and Pike County telephone lines in Illinois, to make arrangements for the laying of a submarine cable under the Mississippi River to connect with the different exchanges. Permission has been secured from the Government for the laying of the cable.

JEFFERSON CITY, MO.—Frank Buffin, of Louisiana, owner of several Independent telephone systems, was here recently conferring with Houck McHenry, of the local telephone company, in regard to making a connection between the companies by way of Fulton. Mr. Buffin recently purchased the Fulton exchange and intends to build a line from Fulton to this city. He will then have connection with St. Louis.

LA GRANGE, MO.—It is expected that the Highland Telephone Company, the Prairie Telephone Company, and the Canton and La Grange Telephone Company will soon construct a line from here to Palmyra, a distance of about 16 miles. A switchboard will also be installed here.

LAKOTA, N. D.—The Lakota Telephone Company has extended its southwestern line into Illinois township. The company expect to run the line as far as Dissmore next spring.

MICHIGAN CITY, N. D.—C. F. Moody, of the North Dakota Telephone Company, was in the city recently, and made arrangements for the placing of a local system of telephones. This will give telephone connection from this city to Fargo, Devils Lake, Lakota, Northwood, and other important points.

HOPKINTON, N. H.—The Hopkinton Telephone Company has decided to extend the line from Contoocook to West Hopkinton.

BATAVIA, N. Y.—The Board of Managers of the State School for the Blind has decided to install a local system of telephones.

FRANKLIN, N. Y.—The Franklin telephone line is to be extended to connect with the Walton and East Brook line, and connection shortly will be made with Plymouth and Walton.

FREEPORT, N. Y.—The South Shore Telephone Company, which operates a system throughout Nassau County, is arranging to improve its service.

ITHACA, N. Y.—The Independent and Home Telephone exchange, with which the Ithaca Telephone Company is in direct association, has completed the line between this city and Cortland, thus opening up communication with the cities of Syracuse and Utica, and all intermediate stations and towns to

Ithacans. The lines extend into St. Lawrence County, then east to Utica, and almost to Rome, which city will soon be connected. Branches have been also extended from Cortland to DeRuyter, Cincinnatus, Homer, Glen Haven, Scott, McGrawville and the intermediate stations. A line is about three-fourths completed between that city and Binghamton, which already takes in Lisle, Marathon, and as far as Chenango Forks. In order that the best accommodations may be offered to subscribers between that city and Syracuse, now taking in Ithaca, two more copper circuits have been put in and the same number will be added to the line connecting with Binghamton. There are now about 1,100 subscribers in Cortland and Homer, which have been taken on since establishing the company about eighteen months ago. Already the exchange has about two hundred toll stations. Manager Irving Whiting, of the Ithaca Telephone Company, announces that the company expects to complete the line between Ithaca and Watkins by the first of January. This connection will bring Ithaca in direct communication with Penn Yan, Geneva, Canandaigua, Rochester, Buffalo and all immediate stations, and to the southwest, assuring connection with Corning, Hornellsville, Wellsburg, Waverly, Athens, Sayre, Towanda and Elmira.

LE ROY, N. Y.—The Inter-Ocean Telephone Company, of Buffalo, is installing a fire alarm service here in return for the privilege of constructing its lines through the town.

LIMA, N. Y.—The Independent Union Telephone Company is setting its poles through the village. It will establish an office here.

SALAMANCA, N. Y.—A large force of men is here reconstructing the Independent Telephone line, which is in combination with the Consolidated Telephone Company. The company is reconstructing its lines so as to give better service. The line has recently been connected with Jamestown and will be ready for the use of the public soon. The single wire to Little Valley has been taxed to its utmost capacity, and so another wire will be strung. Many more improvements are contemplated by the company, which will be announced later.

WATKINS, N. Y.—The Century Telephone Construction Company, with a large force, is stationed at Burdett, putting in a telephone line from Watkins to Ithaca.

CLEVELAND, OHIO.—The Cuyahoga Telephone Company is making preparations for the construction of a new exchange building here.

NEW HOLLAND, PA.—The officers of the Enterprise Telegraph and Telephone Company, with headquarters at New Holland, have received their charter from the State Department and have begun active operations. The first line of the company will run by way of Blue Ball to Weaverland, Terre Hill, Adamstown to Bowmansville. It will push the work as rapidly as possible till it reaches Schoeneck, Blainsport, Reinhold, Denver, Stephens, Ephrata, etc. It expects to network the half of eastern Lancaster county within a year from now, and has already at New Holland two carloads of apparatus to be used. It charges subscribers \$12 per year, and many have already signed the contract.

COAL CREEK, TENN.—It is reported that the People's Telephone Company will soon put in a line of telephones at this place, coming from Clinton to Coal Creek and on to Jellico.

SALT LAKE CITY, UTAH.—M. H. Walker has bought quite a block of stock in the new Home Telephone Company and has been placed on the board of directors. The engineers are preparing plans and specifications so that work may begin without delay. Headquarters for the present will be in the Commercial block offices of Elmer B. Jones. In two weeks Messrs. Fenton and Jones will go East to decide on the selection of material and methods of operation.

ST. JOHNSBURY, VT.—The Citizens' Telephone Company is now connected with the neighboring exchanges so that direct connection can be had with Wells River, Woodsville, Bath, Lisbon, Littleton and towns on both sides of the Connecticut River as far south as Fairlee. The People's Telephone Company has just installed a new switchboard at Sherbrooke and bought 500 new instruments and will make its circuit metallic. Manager Buzzell is gradually extending the lines of the company in all directions and giving, at the same time, excellent service to the patrons.

MARINETTE, WIS.—An effort will be made to construct the Wausaukee-Marinette telephone line from Coleman to Gillette, a distance of eighteen miles, to connect with the Little Wolf system.

MISCELLANEOUS.

HAVELOCK, IA.—Havelock now has a complete local telephone system, organized and managed by the business men of the town. The system is complete in the city, and within two weeks two country lines will be in operation.

KIBBIE, MICH.—The Kibbie Telephone Company has extended its line into Kalamazoo and established an office in that city.

THE WEEK'S MESSAGES Concluded

PHILADELPHIA, PA.—The United Telegraph and Telephone Company and the Keystone State Telegraph and Telephone Company have executed a traffic agreement for a connection with Philadelphia.

NASHVILLE, TENN.—The Cumberland Telephone and Telegraph Company has issued a statement of its business for the month of November, and the increase in the number of subscribers is shown as follows: Subscribers November 1, 1902, 88,920; added during the month, 4,411; discontinued, 2,741; net increase, 1,670. Total number November 29, 90,590.

WEST SALEM, WIS.—An amendment to the articles of the West Salem Telephone Company, changing its name to La Crosse County Telephone Company, has been filed. President, J. George Schweizer; Secretary, Charles H. Schweizer.

WHEELING, W. VA.—The National Telephone Company is about through with the erecting of its lines here. The office is being fitted up with the switchboard and everything is in readiness to begin operation. The Federal lines, which were purchased by the National Company, have been repaired and the telephones are going in rapidly. It now has 150 subscribers and others have been promised. About 75 telephones have already been installed.

PERSONAL.

DULUTH, MINN.—C. C. Kritzer, has retired as manager of the Zenith Telephone Company. M. McDonald will have charge of the business department and A. E. Wickstrom will be superintendent of construction.

TRADE NOTES

THE EUREKA ELECTRIC COMPANY, of Chicago, is installing an entire new central office equipment for the Capital City Telephone Company, of Pierre, S. D. W. S. Rowe, the general manager of the Capital City Company, is putting a good many of the wires underground, this being the first underground cable system installed in South Dakota.

THE CHICAGO PAY STATION COMPANY has just placed a new time stamp on the market for the purpose of keeping an accurate check on toll messages. During the recent Inter-State Convention the representatives of the Chicago Pay Station Company were kept busy exhibiting their apparatus to a large number of visitors in Room 140 of the Auditorium Hotel. The outlook for future business of the company is exceedingly bright.

H. P. DIDRIKSEN, has associated himself with the Eureka Electric Company, manufacturers of telephones and switchboard apparatus, 143-149 South Clinton street, Chicago. Mr. Didriksen, will in the future, have exclusive charge of its advertising and general correspondence, and as he is especially well fitted for his new position, having made an enviable reputation for himself in this line of work while associated with another concern in the same line of trade, there is no question but that the Eureka Electric Company will find in Mr. Didriksen an able man in his position. The line of apparatus that Mr. Didriksen will exploit is such that he will have a chance to put forward his ability, as he has never had in the past, to his credit and the credit of the company.

TOLL LINE CONSTRUCTION IN KENTUCKY.

THE Maysville Telephone Company, of Maysville, Ky., is building up a very fine system of interurban connecting lines. It has just completed and put in operation a new direct full metallic line to Flemingsburg. This line is exclusively for through business, there being no telephones connected en route.

The company has also full metallic lines running to Vanceburg, Mayslick, Tollersboro and Mt. Olivet, and has connections through these points with river towns and cities east of Maysville.

Long distance lines now building and nearly completed will give Maysville connection with Louisville and all Central Kentucky towns.

The officers of the Maysville Telephone Company are: Walter Matthews, president; S. H. Mitchell, vice-president; Dr. Edwin Matthews, secretary, treasurer and manager.

These gentlemen, with the exception of Dr. Matthews, constitute the board of directors, together with James W. Chambers and D. L. Pendelton.

ROYALTY'S TELEPHONE.

EMPEROR WILLIAM I. was the first German who had a telephone in his room, according to the *St. Paul Dispatch*. It was in November, 1877, and the Secretary of State, Heinrich von Stephan, provided him with one, and the first thing the Emperor heard through it was a violin solo. To-day there are in Berlin more than 50,000 telephone places.

PLANTS FOR SALE

Advertisements under this head \$1.00 for 25 words or less for each insertion. Prepaid.

FOR SALE.—One brand new Eureka 100-drop express switchboard and chair; one brand new 10-drop Standard switchboard; will guarantee them and sell at a bargain. Address A. C. SCRIBNER, 30 2d Ave., Gloversville, N. Y.

INVESTMENT OPPORTUNITY.—Telephone plant, 1 year old, 195 subscribers, 85 miles toll lines in booming town, 4,000; connections with Independent long-distance lines in view. Good reason for selling out. Address A, care of AMERICAN TELEPHONE JOURNAL, N. Y.

LEASE:—Wanted to lease telephone or electric light property, by practical, all around electrical man with some capital. Address CAPITAL, care AMERICAN TELEPHONE JOURNAL, New York.

WANTED

Advertisements under this head, 25 cents for 25 words or less for each insertion. Prepaid.

I WANT the exclusive handling of an account, for Chicago trade, beginning January 1st. Manufacturers' Agency basis. Address SALESMAN, care AMERICAN TELEPHONE JOURNAL, Monadnock Building, Chicago.

WANTED—Sober, reliable young man as superintendent of 200 subscriber plant and outside work. Must be thoroughly competent in switchboard and instrument work of magneto and common battery system; hustler, capable of maintaining plant to highest efficiency, and know how to get best work from employes. Address, stating experience, references and salary expected, TELEPHONE, Lock Box 93, Elizabeth City, N. C.

POSITION WANTED by strictly temperate man, 25 years old, with seven years' experience in Independent and Bell systems. Experienced in all branches of work. References from former and present employers. South preferred. Address EXPERIENCE, care AMERICAN TELEPHONE JOURNAL, New York.

MANUFACTURERS: An engineer, experienced in designing common battery apparatus, and with excellent references, desires position with a good telephone manufacturing company. Address ENGINEER, care AMERICAN TELEPHONE JOURNAL, New York.

A HOME IN SOUTHERN CALIFORNIA—I desire to communicate with a man capable of taking charge of a factory for insulating rubber-covered National Code wires. This is a splendid opportunity for the right man. References given and required. No money necessary. Address P. O. BOX 1116, Los Angeles, Cal.

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SOME STEPS IN THE EVOLUTION OF SWITCHBOARD CIRCUITS

Article IV—The Self-Restoring Drop System

By J. C. KELSEY

WITH the advent of the electric railway, grounded service in general became a thing of the past. Not only did this system prove too noisy for commercial service, but the switchboard became too slow and unwieldy to handle the increased business. An effort was made to save time by replacing

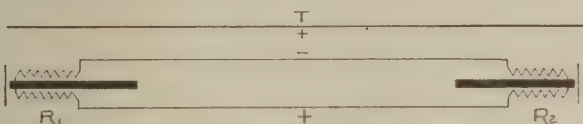


FIG. 20.

the manually restored drops by those which were automatic. This device enabled the operator to handle an increased number of calls and to give better supervision. But even in the improved system about to be described the supervision was uncertain, because in busy positions connections would overwhelm the operator.

Changing from series grounded lines to the improved self-restoring board caused the majority of lines entering the exchange to become metallic; consequently the new system was designed on a metallic basis, yet so arranged as to suitably handle whatever grounded service remained. In a metallic system the

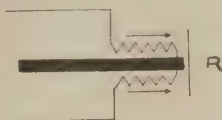


FIG. 21.

necessities of a perfectly balanced circuit become more apparent, and the clearing-out drop is no longer in series, but bridged across the circuit, having a resistance of not less than five hundred ohms. If the old clearing-out drop is left on one side of the cord circuit a state of unbalance exists by reason of more resistance on one side of the line than the other, causing a shifting of the neutral points ordinarily existing at the middle of the receiver windings.

Fig. 20 shows a perfectly balanced circuit paralleled by a disturbing trolley wire T. Consider the wire as having a positive potential. A negative charge is induced on the nearest wire of the

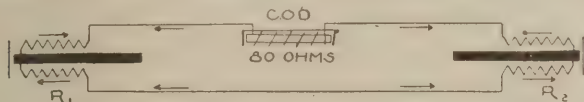


FIG. 22.

pair, and in turn a positive charge on the other. The receivers R^1 and R^2 are in the circuit at opposite ends, and the middle points of their windings would be the neutral points, where no current would flow when the line potential is disturbed.

Fig. 21 shows the effect of two currents of equal strength passing into the receiver windings in opposite directions. The diaphragm will not be influenced, and no sound will be heard.

Fig. 22 shows the effect upon the receivers with an 80-ohm clearing-out drop in one side of the circuit in series.

The positive and negative charges still seek equilibrium, but as one side of the circuit has more resistance than the other if the neutral point is shifted away from the receivers, and current flows through them, thereby magnetizing the diaphragms and causing a sound. As the disturbing wire is the seat of a continuous change

EDITOR'S NOTE.—The first article of this series appeared in the issue of Nov. 29. They will continue for many months.

of currents, the pair of wires will be the seat of a continuous induced change, which the receivers will faithfully record, and so one can hear the electric cars start and stop and the hum of the central station generators.

Where no electric disturbance is felt no trouble arises from the drop on one side. But connect a party to a long toll line with such a cord circuit, and the evil of unbalance manifests itself very plainly.

Consider now the instrument generally used. The best conditions demand a bridging telephone—one having an open circuit generator and a high resistance bell of not less than 1,000 ohms. The generator is so arranged that normally it stands open, the

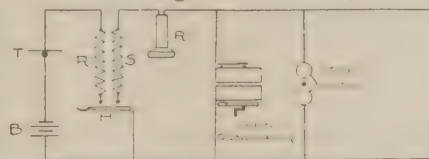


FIG. 23.

exact opposite of the shunt generator. In this way any number of subscribers may be connected on one line without unbalancing the circuit.

Fig. 23 shows the bridging instrument with the talking circuit the same as the series instrument, but the ringing circuit reversed; that is, to ring the series bell, the circuit must be closed or short-circuited, but if one short-circuits a bridging instrument the bell will not ring when the magneto handle is turned. The

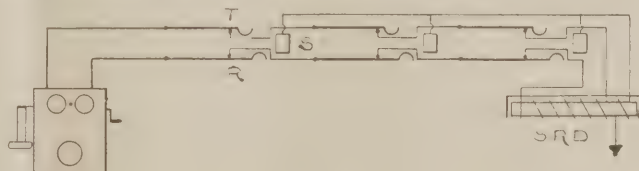


FIG. 24.

series subscriber can readily tell if his line is open; the bridging subscriber can as readily know if his line is crossed. The series system used a single point plug; the metallic system described uses a three-point plug, still employed in many of the common battery systems, but the tendency is to use a two-point plug and a single-spring jack, using the sleeve as a contact of the talking circuit. The jack of the system in hand had four springs, two movable and two immovable, so arranged as to cut off the line signal, employing the sleeve to hold the plug rigid and to give the busy test.

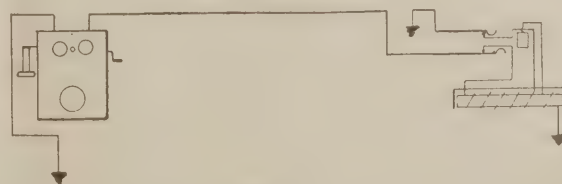


FIG. 25.

The line signal has two windings, one of 600 ohms and the other of 50 ohms. The high winding receives the subscriber's ringing current, throwing an armature, which raises an aluminum shutter, exposing the number. This armature does not fall out of the magnetic influence of the 50 ohm winding, which, when

energized by a continuous current, pulls back the armature and allows the aluminum shutter to fall, covering the number.

Fig. 24 shows the subscriber's line, jack and self-restoring drop. T, R and S are the tip, ring and sleeve of the jack and S R D the

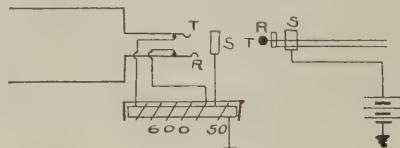


FIG. 26.

drop. The jack springs are connected in series, so that each operator cuts off the line drop when plugged in, while the sleeves are connected in multiple. Tip and ring terminate in the 600-ohm winding, while the sleeve is connected to the 50-ohm restoring coil, thence to a battery return.

Fig. 25 shows a grounded subscriber connected to the exchange, one terminal to ground at the station, the other entering the exchange at the ring spring of the jack, through the drop S R D to the final tip spring, thence to ground.

The cord circuit of this system performs the same work as the series cord circuit, with the addition of furnishing the battery for the restoration of the line signal upon the insertion of the plug.

For this purpose eight volts is placed on the sleeve of the plug, which, coming in contact with the sleeve of the jack, closes the circuit through the 50-ohm restoring winding and pulls back the armature of the drop. This is shown in Fig. 26. Another feature is the automatic restoration of the clearing-out drop; so the listening key has two extra springs whereby the act of operating

the key K^1 , automatically closed a battery circuit through the restoring winding of C O D.

Fig. 27 shows the cord circuit, with listening key K^1 ; K^3 , the ringing key of the calling cord; and K^2 the ringing key, or ring back of the answering cord; T, R and S, the answering plug; T^1 , R^1 and S^1 , the calling plug; R B, the restoring battery; C O D, the clearing-out drop; and with the operator's set not lettered.

A call throws the shutter and the operator answers with T R S. Pressing cam of K^1 , she bridges her operating set and locks the drop C O D, which would otherwise be thrown by the busy test. The act of plugging has restored the line drop, and after ascertaining the number wanted the operator tests, and if the called line is disengaged, will insert the calling plug T^1 R^1 S^1 and press

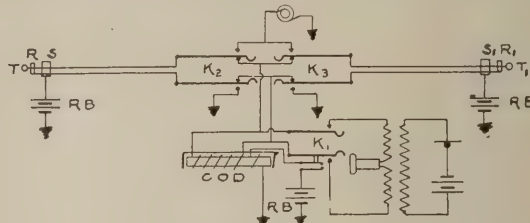


FIG. 27.

cam K^3 . When the parties ring off the drop shutter C O D falls, and the operator in verifying the signal presses cam of K^1 , automatically restores C O D, and is ready for the next call.

Ten years ago this circuit gained considerable currency, but is now being rapidly superseded by many forms, avoiding the salient objectionable features of the old "branch terminal" board.

THE USE OF BUCK ARMS

By H. A. BRINKERHOFF

IT is a custom among telephone engineers and construction men when taking a branch lead of open wire from a main lead, to make a "Y" or two-pole corner, or else use what are known as "buck-arms," that is, cross arms placed at right angles to each other.

When a "Y" corner cannot be made recourse is had to buck-arms, which are less satisfactory for several reasons.

If the line arm (the one to which the wire first reaches from the exchange) and buck-arms (one carrying wires running at right angles) are put on the pole alternately, starting with the line arm, and the pole has a diameter of seven inches or more, the inner pins on each pair of buck arms will have to be removed and set out further from the center of the arms or else replaced by knobs before the arm can be put on, as the diameter of the pole plus the width of the pair of arms above is greater than the distance between the inner pins of the buck-arms, in either case making a weak point which sooner or later will give trouble. The only way to obviate this is to place the arms eighteen inches or more apart, which is objectionable, pole space being too valuable for this expedient.

If the buck-arms are all placed below the lowest line arm, one or more strands of guy wire attached between the arms, will, with the wire pulling in opposite directions, hold the pole immovable from the point of attachment down, having virtually the same effect as setting the pole up to this point in the ground, with the great disadvantage of being weakened by the removal of wood in cutting the gains for the arms at a point where the most strength is needed.

Under these conditions should a high wind start the main lead to swinging it is more than probable that the pole would break off at the upper buck-arm. All telephone men who have been through one or two heavy storms have found this to be the case.

During the building of the new exchange at Texarkana, Texas, the past summer, the writer found it would be necessary to take off a large number of branch leads carrying from ten to thirty wires, and where cable distribution could not be economically used. Owing to local conditions, to make "Y" corners were impossible, so the following method was devised, which while more expensive, is much better from a mechanical standpoint and has the further advantage of a neat appearance.

Over the leads which did not carry cables it was necessary to string one span of three-eighths twisted guy wire, the ends of

which were carried to the poles each side of the span and attached about seven feet from the ground.

The "Y" method is the best, not only for branch leads, but for all corners, and should be followed whenever possible. This, however, is not always feasible, owing to a lack of space for a guy stub and anchor, or an obstreperous property owner may appear on the scene.

On main leads carrying cables and messenger, the arrangement was as follows:

The first pole of the branch leads was set ten to twenty feet back of the property line. The guys, one or more, were carried under and at right angles to the main lead across the street to a stub and anchor, and the line wire strung and pulled in order to take the sag from the guy wire.

The upper guy strand was then tied by a vertical number six wire, to one of the messenger strands on the main lead. The wire which is intended to carry into the branch lead was dead-ended in the usual way on double arms on the main and branch leads. Rubber or paper lead covered cable was strung from one set of double arms over the messenger, vertical and upper guy wires to the double arms on the branch lead, and terminated in pot-heads placed between or just below the arms on the side of the pole.

The pot-heads were made in the regular manner, except rubber covered and braided wire was used, and after the head was filled with "Ozite" a lead cap was fitted over the top and secured to the sleeve at two places by solder; the sleeve and cap wire then fastened to the pole by heavy lead straps, and the insulated wire taken to the respective pins; the extra wires were neatly coiled and fastened to the arm or pole.

The filling of the heads should be done carefully, allowed to settle and be refilled before the cap is put on, and under no circumstances should paraffine be used, as a small crack will soon open between the sleeve and the wax and will in time admit enough moisture to cause trouble. Any cable can be terminated in this manner, and a line fuse used between the end of the spider or bridle and the line wires, which will protect the cable.

This method of terminating effects quite a saving, as no cable box and platform is necessary, and in addition is very sightly.

The only objection visible is the necessity of splicing a damaged bridle wire, or else opening the pot-head, which is a difficult undertaking.

TELEPHONE CIRCUITS—ARTICLE V.

BY H. P. CLAUSEN

FIG. 184 shows a method for connecting two wires. The lines running at right angle are joined by a small dot. In cases where a number of wires are connected to the bus-bars of a battery or other terminals, Fig. 185 will be followed.

CIRCUIT WIRES.

In Fig. 186 a twisted pair circuit, the insulated wires which it



FIG. 184.

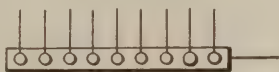


FIG. 185.



FIG. 186.

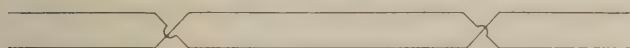


FIG. 187.



FIG. 188.

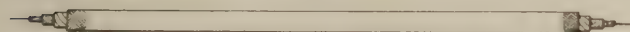


FIG. 189.



FIG. 190.

represents are supposed to be twisted together to produce a non-inductive relation. Fig. 187 represents a transposition construction, while Fig. 188 may be used for a distributing circuit, such as an alternating current lead passing alongside of a telephone line. Fig. 189 is a submarine and armored cable. In Fig. 190 two methods are shown whereby a circuit may be diagrammatically shown as burdened with capacity. In Fig. 191 two methods are



FIG. 191.



FIG. 192.

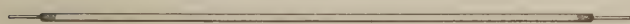


FIG. 193.



FIG. 194.

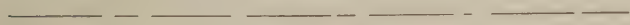


FIG. 195.

shown of distributed leakage. The left hand portion is the more proper one, as the permanent grounds shown on the right hand convey the idea of permanent ground, where it is only intended to show leakage. Fig. 192 shows plain bare wire, representing outside construction lines, as circuit diagrams would not call for drawing both lines. Fig. 193 shows a plain insulated wire, while Fig. 194 is a wire with retardation and resistance, the retardation

being shown by drawing light lines through the zig-zag lines. Fig. 195 is a method to show an outside line circuit of considerable length. Notice that the lines are of intermittent lengths and broken. To clearly indicate different parts of circuit certain line conventions are desirable, thus Fig. 196 is for local wiring outside of switchboard circuits; Fig. 197 direct circuit lines, Fig. 198 generator leads; Fig. 199 circuits common to several parts of a general circuit, while Fig. 200 is used for operators' circuits; Fig. 201 for generator commons and Fig. 202 for operators' circuit commons. Another method is given where the differently drawn lines are not used in Figs. 203 to 214 inclusive in which direct wires may be made to turn corners. This the writer considers an important point, for while he does not believe that the differ-

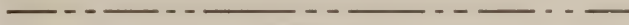


FIG. 196.

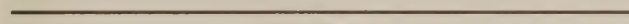


FIG. 197.



FIG. 198.



FIG. 199.



FIG. 200.



FIG. 201.



FIG. 202.

ently constructed lines shown by Figs. 196 to 202 inclusive are of much value in general circuit diagrams he does believe that where a large number of lines are used all direct circuit lines should be drawn light, while all lines common to several circuits should be drawn heavy. This plan permits of using the corner diagrams, thus Fig. 203 might be considered a direct circuit generator lead while Fig. 204 a direct circuit lead but common to several such circuits. In case of a direct circuit battery lead, Fig. 205 becomes useful and Fig. 206 the common. Fig. 207 and Fig. 208 respectively show a direct circuit and commoned talking circuit lead.

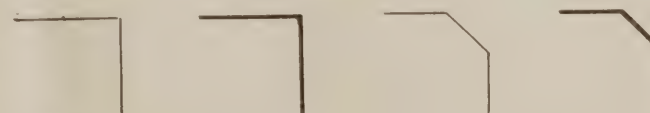


FIG. 203.



FIG. 204.



FIG. 205.



FIG. 206.



FIG. 207.



FIG. 208.



FIG. 209.



FIG. 210.



FIG. 211.



FIG. 212.



FIG. 213.



FIG. 214.

Now a combination of the talking circuit lead and the generator lead, while it does not occur often, may be considered of enough importance to show, thus Fig. 209 gives a combination of Figs. 203 and 207, indicating a combination of the ringing and talking circuits, while if this system is common to others of a like character, then Fig. 210 may be used. To provide for the combination of a battery lead and generator circuit there are Fig. 211 and 212 and when a combination of a battery lead and talking circuit is called for Figs. 213 and 214.

CONTEMPORARY CROSS-TALK

THE question of telephone etiquette, which we were discussing last week, naturally interests us from the point of view of the subscriber who is the victim of breaches of etiquette on the part of other subscribers. Since what all telephone managers desire is a rapid and efficient service, worked harmoniously by all concerned and giving satisfactory results to all concerned, they must necessarily view with regret the peculiar methods of some subscribers which cause offence to other subscribers and are apt to provoke these latter into adopting measures of retaliation. But the breaches of telephone etiquette which we have been discussing have an immediate and important bearing on the efficiency and economy of the telephone system as a profit-earning machine. Therefore, it is doubly necessary for the telephone manager who aims at the highest efficiency and economy to instill into his subscribers a proper regard for the correct code of telephone etiquette. If this code is generally adhered to, not only do all the subscribers get a more harmonious, satisfactory and efficient service, but the plant is used more effectively and hence more economically.

* * *

The first principle of telephone etiquette demands that *the calling subscriber should be at the telephone when called subscriber answers*. That, obviously secures in the quickest way what we have defined as the object of a telephone call: the putting into direct communication of two specific individuals. We have already looked at the unhappy practice of calling by deputy from the point of view of the subscriber who is a victim of it. Now let us look at it from the point of view of the telephone company, whose object naturally is to use the telephone plant as effectively and economically as possible. The telephone subscriber who calls by deputy says, in effect, to the telephone company something like this: "You connect this station to the station of Blank, and when the stations are connected, and when Blank comes to his telephone, and when my young man tells me that Blank is waiting at his telephone, and when I get good and ready, I will go to my telephone and talk to Blank, for whom I have a message."

* * *

Now, this is precious poor business for the telephone company working on the minute-mile basis and knowing that its profits depend on keeping down the number of minute-miles in the average message. In a message which the subscriber operates in this manner the time during which the plant is uselessly and unprofitably employed is unduly and unnecessarily prolonged. In every message, as we have seen, there is a period, from the moment of connection to the moment of the called subscriber's answer, during which the plant is locked up unprofitably—both lines "busy" and neither doing any useful work. But here, in the message operated in disregard of the first principle of telephone etiquette, we have a second and totally distinct period of unprofitable occupation of the plant, the period from the moment the called subscriber appears on the line to the moment that the person who really desires to send the message, being informed by his deputy that his correspondent is at the telephone, appears on the line at his end. As may readily be understood, as in fact is a matter of common observation, this period may be prolonged by a variety of causes; the deputy may be slow, awkward and unintelligent, the principal may have got momentarily out of the way, or may have become absorbed in some work that he cannot leave in an instant, may have become occupied with a caller or even engaged in conversation on another telephone. Even if there is no unusual delay, however, it is still a period of unprofitable employment for the telephone plant.

* * *

The subscriber who operates the service in this way, making his calls by deputy and going to the telephone himself only when assured that the person he wishes to talk with is on the line, presumably has no conception of what goes on behind the scenes, as it were, of the work that is done and the appliances that are called into action in order to build up the telephone connection that he orders to be built up and then to await his lordly pleasure before he makes use of it. Nor can he have any idea of the value of the time he wastes by this method of operating, since the value of the time is measured by the amount of plant that he keeps standing idle unnecessarily. Since he

never stops to think of the machinery he sets in motion when he orders a telephone call made he is unable to appreciate that in keeping that machinery set apart for his sole use any longer than is absolutely necessary he is doing the telephone company a direct injustice and causing a direct loss by unprofitable work.

* * *

Even among old telephone subscribers there is a most deplorable amount of ignorance as to the actual working of the telephone system. If telephone subscribers were more familiar with the inside working of the service they would undoubtedly do their share of the operating much better than they do now. In this one instance of calling by deputy, for example, the subscriber addicted to the practice sees no harm whatever in saying to his clerk or his office boy, "Get Mr. Blank on the telephone and call me when you have got him." If he clearly understood that in working the service in this way he is saying to the telephone company, "I want you to build up a line between my station and that of Mr. Blank, and get Mr. Blank to the telephone and then hold the line at my disposal until I am informed that Mr. Blank is there and am ready to come and talk with him," he would appreciate that he is asking something unreasonable, vexatious, time-wasting and unprofitable.

* * *

Take an illustration in a large system containing several central offices. The traffic is mostly trunked from one office to another, so that Mr. Jones, the subscriber addicted to calling by deputy, whose number is 2463 Main, wants six or seven out of every ten times that he uses the telephone a subscriber connected to "East," or "West," or some other exchange. To him it is a simple matter to tell his clerk to call Mr. Brown, whose number is, say, 994 West. But in calling 994 West he is saying to the telephone company something like this: "Your operator is to answer this signal, is to repeat back the number '994 West' to my clerk, is then to connect herself by means of a special wire to another operator at the 'West' exchange and tell that operator that she wants 994, is then to connect my wire to the particular trunk line extending from main exchange to West exchange which she is told by the operator at 'West' to use, and this latter operator is then to connect the trunk line to the line of 994 and ring on that line until someone at the station answers. Then you are to keep those lines connected until I am assured by my clerk that Mr. Brown is at his telephone waiting for me to talk to him." Did the subscriber who habitually calls by deputy understand that this is what he orders done when he orders a telephone call made, he would appreciate that his method of telephoning is irrational and time wasting.

* * *

There are probably not so many offenders against telephone etiquette as there were in the early days of the telephone service. The improvement in the service, the wide use of desk telephones and the general if somewhat slow growth of efficiency among the telephone-using public have worked in favor of the direct use of the telephone which the interests of subscribers and telephone company alike demand. But there are still many hardened offenders against all the common-sense rules of telephoning, and there are constant recruits to the ranks of telephone subscribers among whom there is the most complete ignorance of the proper method of using the service. Therefore, telephone managers must not be content to let these evils cure themselves, for human nature is unregenerate and cannot safely be left to find its own way. If the service is to be harmonious and satisfactory, prompt and efficient from the company's point of view as well as from that of the subscriber, it is necessary that the subscribers be gently and effectively instructed on this important point of telephone etiquette as well as in the actual operation of the subscriber's end of the system. In analyzing the time occupied by the average local message we have seen that by far the larger proportion of unprofitable time is due wholly to the subscriber. We can improve the efficiency of the operating from the exchange end and so reduce the minute-miles in the average local message, but by the systematic education of subscribers in telephone operating and telephone etiquette we can effect still larger and more important gains.

The Listening Key.

THE "CLAIM DEPARTMENT" OF A TELEPHONE COMPANY

By WILLIAM H. HYDE

QUITE a little money may be saved if shipping clerks, exchange managers and foremen are instructed to properly mark material shipped so as to get the correct "classification" and "freight rating."

Shippers should be instructed when paying freight charges, to have the railway agent give an expense bill showing the different kinds of material properly classified, with the rates, and attach these freight receipts to their freight vouchers. At the end of the month when these vouchers are sent in for credit these

FIGURE B.

CLAIM TRACER.

Our Claim No.....
Your Claim No.....
Amount

Dear Sir:—

Papers in our claim as noted above, for
on shipment of.....from.....
consigned to.....
were sent you.....100.....

If same are now in your office we would ask you to use your best efforts to facilitate an early settlement. Note present status hereon and return tracer promptly.

Yours truly,

.....Telephone Co.,
Per.....

expense bills should be checked over by some one who has posted himself as to rates, etc., to see that the different articles are given the proper classification, and the correct rating; if not, a "claim" should be made on the railroad company, over which the goods were shipped, for a refund.

The Eastern or official classification for telephone supplies and material, at the present time, is as follows:

FIRST CLASS.

Instruments and parts. Carboys (filled).

Switchboards and parts.
Arresters.
Tree trimmers.

Battery cups.
Dry batteries.

SECOND CLASS.

Battery jars.
Booths K. D. (flat).
Sal-ammoniac.
Tools (boxed).

THIRD CLASS.

Battery zincs.
Battery coppers.
Hardware (boxed).
Blocks and tackle.
Derrick blocks.
Loys (marked spades).
Shovels.
Spoons.
Reels (take up).
Reels (pay out).

Carboys (empty).
Demijohns (empty).
Copper wire.
Annunciator wire.
Okonite wire
Safety wire.
Knobs (porcelain).
Cable on reels.
Insulators.

FOURTH CLASS.

Brackets (crated).	Iron braces.
Pins (boxed).	Wire rope (iron or steel).
Iron wire.	Anchor rods.
Iron bolts.	Pole steps.

Blue vitriol (bags, barrels or casks).
Conduit (less than carload lots).
Cross arms (wood).

CARLOAD LOTS.

Conduit (vitrified clay), takes 5th class in carload lots.
Cross arms (wood), take 6th class in carload lots.
Poles (wood), take 6th class in carload lots.

The Western classification of material differs somewhat from the Eastern classification, but the proper one can be obtained to fit the locality by referring to the printed classifications furnished by the railroads. After the goods have been checked to see if properly classified by referring to the rate book of the railroad over which the goods were shipped, which any railroad will furnish on application, the correct rate may be found under the different classes. With this information the railway expense bills may be readily checked and claims filed for any overcharges.

A very good form to be used for a claim blank is shown at figure A. This blank should be printed in copying ink so that the claim may be copied in full in the claim book..

For the purpose of tracing up old unsettled claims, a claim tracer should be used. (See figure B.)

FIGURE A.

.....190..

To.....Dr.

acc't of.....on.....from.....

to..... as per statement below; original expense bill attached:

R. R. Claim No..... Our Claim No.....

Authority.....

When acknowledging receipt, please give our Claim number.



The Operating Field

BELL LOSING GROUND IN KOKOMO, IND.

A HOT telephone war is on at Kokomo, Ind., where the Home Telephone Company has just got its plant into fine operating trim. The Central Union Telephone Company, which for years had a monopoly of the local service, and to the last held rates up to the highest practicable point, has now begun a savage fight on the local company, in an effort to drive the latter out of business. The new rates of the Bell company are \$6 per year in residences, or if contract is for three months, \$1 per month. One year in business houses, \$12; three months in business houses, \$2 per month. This is a cut of more than 50 per cent. The new company's rate is \$2 and \$1.50 per month, and it has taken most of the Bell's patrons. If the people of Kokomo are wise they will remain loyal to the Independent company, which can furnish first class service, and which has brought about the sweeping reduction in the Bell rates. With the Bell alone in the field the telephone patrons in Kokomo may be sure they would now be paying fancy rates for service.

WILL RAISE ITS RATES

IN the near future, by the first of the year, it is said, the Wisconsin Telephone Company will raise its rates in La Crosse, Wis. Just what the raise will be is not known. The company asserts that at its present rates it is not making any money. The rates are considerably lower than those of the Independent Telephone Company.

The history of the competition between the two companies is the usual conflict of competing lines. The Bell Company had a monopoly, being alone in the field, and charged an exorbitant rate. A number of years ago the Independent Telephone Company was started, backed almost exclusively by local capital, and it immediately adopted a rate of \$2.50 for the business district and \$1.50 for the residence district, a figure considerably lower than the Bell rate. The Bell people, to meet this cut, made a rate of \$1.25 in the business district and \$1.00 in the suburbs. But so great was the prestige enjoyed by the Independent Company, owing to its local inception, that the competition was unable to drive it from the field, the people patronizing it on the basis of patriotism and good service alike.

THE NEW PLANT FOR VINCENNES, IND.

THE new Independent telephone plant being put in by the Knox County Home Telephone Company in Vincennes, Ind., is rapidly nearing completion and will soon be giving to its patrons a high class service. This company in 1895 secured an unconditional perpetual franchise from the city of Vincennes, but not until the last few months was any move made towards definite organization and construction. This summer a petition was circulated urging the company to install its system, giving as the reason the poor service afforded by the Bell Company. At that time W. H. Vollner, was made president, and Gerard Ride, vice-president. Along with these, other prominent business men were appointed as directors. Senator R. M. Purcell, of the Western Sun, D. A. Yoder, present manager of the plant, J. E. Flunkard, E. E. Weisman and R. E. Gardner. The company was organized with \$125,000 capital stock, of which \$90,000 was issued and \$10,000 more will be put out soon. The stock is all held by Vincennes business interests.

Work was begun immediately after organization and the town built up regardless of subscribers. Contracts for seven hundred telephones were secured. In the county offices and in nearly all

the business houses the Bell telephones were ordered out and the Independent company is now putting in its telephones instead. The Bell company is at present resorting to every possible method to hold patronage. Unconditional individual lines are being put in on 30 days' contract. In many cases, livery stables and offices are offered telephones at private residence rates. In spite of this opposition the Independent company is installing new telephones at the rate of twenty to twenty-five a week.

The new company's construction work and material is of the very best. Twelve miles of underground conduits, with an ultimate capacity of 3,500 lines, cover the business section of the city. In aerial construction, only white pine poles, bearing in no case more than five cross arms are used. All the circuits are metallic copper wire, and all lines are individual.

The exchange building is located in the very heart of the city. A new two-story brick building with stone front, and designed especially for occupancy by this plant, was erected. In the basement are the storage batteries, furnace, and gas engine, used for running the dynamo. This method of power furnishing is found to give excellent satisfaction at a cost of only \$7.00 per month for 4,000 miles of wire charged. A saving of several hundred dollars a year is thus effected. On the first floor is the manager's room, calling room and rack and terminal rooms. Upstairs there is a large operating room 35 x 25 feet in which the switchboard is being installed. The plant now requires six operators, and when everything is completed will require fully that many more, besides the two long distance operators. At one end of this operating room is a cozily fitted resting room, overlooking a magnificent view of the Wabash. A locker room and toilet room fill up the remaining upstairs space. The interior is handsomely decorated in oriental design. All the machinery and appliances are furnished by the Kellogg Switchboard and Supply Company.

Toll line connections have been established with 35 Independent companies in southern Indiana. Besides these several rural systems are being directly connected at a rate of two dollars per annum for each telephone. These country plants are all splendidly equipped and extending rapidly. The Knox County company is also negotiating with a large Independent company across the Wabash, in Lawrenceville, Illinois. This company has been sublicensed by the Bell, but its contract expires shortly, and the Vincennes Independent line is making a strong fight to take the Bell place. Wires have always been run across the general traffic bridge to the Illinois side. In case the Knox County Telephone Company fails to get a contract with the Illinois plant, Manager Yoder, states that he will build a competitive line across the river.

DECISION FAVORABLE TO SMALL COMPANIES

THE Fourth Appellate Division of New York State has decided, by Justice Hiscock, that a telephone company has the right, with the permission and under the control of the authorities, to erect poles and string wires through the main street of a village of several thousand inhabitants, notwithstanding that the abutting property owners refuse to give their consent. The village in question is Salamanca, N. Y. The property owners there own to the centre of the street. The defendant had no right to erect the poles unless their erection was within the limits of the public easement in the street, and it is settled that the ownership by a property owner of the fee to the centre of a street does not give him the right to prevent any additional use of the street, provided such use is within the limits of the public easement. Justice Hiscock held that while a city street may be

THE OPERATING FIELD

subjected to many purposes that would not be necessary or proper in a country highway, there was nothing to show—as no hard and fast line could be drawn—what class the Salamanca street came under. The Justice said in part: "In considering what are the proper limits of lawful public use of a street or highway, a natural and well-defined distinction has been drawn by the courts between rural or country roads and city streets. Passing upon the right of a telephone company like defendant to place its wires in a public street in a city, this court has fully held and decided that such right was within the limits of the public easement in a city street. In the classification of, and distinction to be drawn between city streets and rural highways, the courts have treated village streets as more analogous and akin to the former than to the latter. Such conclusion is a natural one. No fixed and arbitrary line upon the subject of public uses and necessities can be drawn between the streets of a city and a village. The more populous the latter becomes, the more extensive will be its public needs and the demand for public conveniences.

COMPETITION IN BELL STRONGHOLD

THE Northeastern Telephone Company, of Portland, Me., is about to install a telephone system for 2,500 subscribers with an ultimate capacity of 6,000. It has purchased a building lot in the central part of the city and will erect a new three-story, fireproof building for the exclusive use of the exchange and company offices. John B. Pierce, engineer, of Cleveland, Ohio, is making the plans for the subway and cable distribution. Contracts will be let for all of the material for the outside construction within the next thirty days. The company will require 250,000 feet of conduit, 175 manholes, 2,000 poles, 200,000 feet of cable, both aerial and underground, cross-arms, hardware, insulated wire, construction tools and general outside supplies.

Plans for the building are being drawn by a local architect and the construction of the building will be pushed throughout the winter.

The company will be giving service about the 1st of October, 1903, with something like 2,500 subscribers.

The work of securing contracts has already been commenced. Rates will be \$24 for residences and \$42 for business, with a combination contract, residence and business for \$60. The Bell Company is now getting from \$24 on a six-party line to \$84 for single lines, unlimited service, business or residence. The Bell Company has 2,200 subscribers. The Northeastern Company is operating several hundred miles of toll lines and the lines are already into Portland. L. A. Goudy is vice-president and general manager.

IOWA TELEPHONE MEETING

A CONVENTION of the Independent telephone companies of southwestern Iowa was held in Council Bluffs, Ia., at the Grand Hotel, Tuesday, December 23. The call for the meeting was signed by the following: George E. Atkinson, Creston Mutual Telephone Company; B. P. Babson, Conway Telephone Company; H. W. Cutshall, Shelby Telephone Company; J. F. Glenn, Crawford County Telephone Company; P. C. Holdoegal, Central Telephone Company; J. W. Huff, Monona Telephone Company; F. R. Musson, Musson Bros.' Telephone Company; H. A. Kinney and M. A. Reed, Woodbine Telephone Company.

The purposes of the meeting, as set forth in the call were:

To organize a telephone association for southwestern Iowa.

To consider the matter of rates and long distance construction and connections.

To consider the feasibility of attempting to secure terminal facilities in Council Bluffs.

To transact such other business as may be regularly brought before the meeting.

This meeting in Council Bluffs of the Independent telephone companies in that section of the state is a result of the meeting in Chicago of the Interstate Independent Telephone Association.

The principal object of the meeting was to establish a terminal

in Council Bluffs for the Independent telephone companies now doing business in that section of the state, with a view to securing a franchise in Council Bluffs in opposition to the Bell Telephone Company.

TWIN CITY TELEPHONE GROWING

E. H. MOULTON, the president of the Twin City Telephone Company, of Minneapolis and St. Paul, Minn., in an interview recently said in regard to his company:

"Few people outside of the company's management comprehend the wonderful growth we have had. The new owners assumed control in April, 1901. At that time we had few subscribers and our total income was at the rate of but \$30,000 a year. We believed, however, that the public would appreciate and support a local company giving first class service at a reasonable cost. The statement of our cash collections by months since that time shows we were not mistaken."

CASH COLLECTIONS.

On the basis of—	Per annum.
January, 1901.....	\$16,716.60
February, 1901.....	27,363.24
March, 1901.....	31,080.60
April, 1901.....	30,072.00
May, 1901.....	42,948.00
June, 1901.....	49,667.88
July, 1901.....	54,947.28
August, 1901.....	61,433.64
September, 1901.....	69,153.96
October, 1901.....	83,312.88
November, 1901.....	92,035.68
December, 1901.....	102,791.64
January, 1902.....	119,195.04
February, 1902.....	130,852.44
March, 1902.....	149,528.64
April, 1902.....	168,491.52
May, 1902.....	193,646.16
June, 1902.....	200,769.60
July, 1902.....	217,028.04
August, 1902.....	225,861.48
September, 1902.....	232,135.92
October, 1902.....	255,966.24
November, 1902.....	264,041.80

EARNINGS AND EXPENSES.

Gross earnings.....	\$271,446.72
Operation and maintenance, taxes and insurance	139,286.20
Net earnings.....	\$132,160.52
Interest on bonds.....	\$50,000.00
Dividend on outstanding preferred stock	21,000.00
	71,000.00
Surplus	\$61,160.52

Surplus earnings amounting to over 6 per cent on the common stock are being used in extending the company's lines. "The future of the Twin City Company is now assured and nothing can prevent it from being one of the largest and most prosperous telephone companies in the country. Before the advent of competition, the telephone users of Minneapolis and St. Paul were paying \$120 and \$75 per annum for single line business and residence telephones, and at even these high rates it was only possible to talk to 4,000 subscribers, whereas to-day over the Twin City Telephone lines it is possible to talk to 8,000 for \$48 and \$30.

"It has its own connections to Duluth and Superior through the Consolidated Telephone and Telegraph Company, and following the policy of giving the best of service at a moderate price, its charge for three minutes' conversation is 40 cents. The previous rate had been 75 cents. It has about completed a line to Mankato and next year expects to begin a system of long distance lines radiating to all parts of Minnesota and the Dakotas."

Opinion and Comment

KIND WORDS FROM READERS

SINCE THE AMERICAN TELEPHONE JOURNAL was remodelled with the first issue of this year, the editor has received many kind expressions of approval from his readers. Now and then there have come notes of bitter criticism, but even these have proved on the whole encouraging, because they showed that the course of the paper was being closely watched by its enemies as well as its friends, that the work it was doing for Independent telephony was causing uneasiness to the other side.

Generally the writers of the unfriendly letters have contented themselves with explosive abuse, but occasionally they went to the length of making threats. Altogether within the past twelve months fourteen libel suits have been promised by Bell corporations, or individuals inspired by Bell interests, but of the whole number not one has come to a head, nor is THE AMERICAN

TELEPHONE JOURNAL particularly apprehensive that they will come to anything. It would give us unalloyed pleasure to defend one of these threatened suits in open court, for it would then be possible to dig up the entire system of underhand work so skilfully employed by the Bell in its fight for existence.

However, it is not of the Bell, nor of the Bell inspired critics that the editor wishes to speak in this issue. The holiday spirit is upon him and he desires to think for the time being only of his friends, leaving the others to be dealt with later on. He wants to return thanks for all the eulogistic things that have been said of THE AMERICAN TELEPHONE JOURNAL during the past year.

To reprint all these expressions of encouragement and good will would require several papers as large as this entire issue. Manifestly that is impossible. But it is possible to give a few that will mirror the whole.

THE WIDEST READ.

The American Telephone Journal is the most read of all the technical papers that come into our office.
WILLIS L. CARR,
Cedar Rapids and Marion Telephone Co.,
Cedar Rapids, Ia.

A BONANZA.

We believe that the Journal contains all the information a party can seek, and particularly the number of December 6th is a bonanza, and is O. K.
J. D. SCHROEDER,
Mgr. North Star Telephone Co.,
Mountain Lake, Minn.

THE BEST PAPER.

I consider your issue of the American Telephone Journal of December 6th the best telephone paper I have ever read.
J. E. HILBISH,
Engineering Department,
Kellogg Switchboard & Supply Co.

THE FINEST ELECTRICAL PAPER.

Your issue of December 6th is one of the finest issues ever sent out by any electrical journal, and you are to be congratulated upon the success achieved during the present year.
A. L. HUTCHINSON,
Secy. & G. M. Interurban Co.,
Weyauwega, Wis.

AN EXPRESSION OF APPRECIATION.

We have been reading your Journal for more than a year and wish to express to you our appreciation of it.
C. W. BOLTON,
Gen. Mgr. Ala., Miss & Tenn. Telephone Co.,
Pontotoc, Miss.

SURPASSES ALL OTHERS.

You have improved your paper until it far surpasses all other journals. Every telephone man should have it.
E. G. KATHCART.

DESERVES CREDIT.

One of the most thoroughly enjoyed events in my business life of to-day was the receipt of the Inter-State number of your Journal. Accept my sincere congratulations and best wishes for the future of this enterprising periodical. You deserve a great deal of credit for your frank and fearless defense of Independent telephony, and I am certain that among the telephone public your efforts in this direction will be greatly appreciated and rewarded.

MAX LOEWENTHAL,
Prometheus Electric Co.

A JOY TO SUBSCRIBERS.

I can only express my admiration for the graceful manner in which the Journal is edited and the beautiful appearance of your pages. Your advertising section must be a perpetual joy to you, as your editorial pages undoubtedly are to your subscribers.
C. H. CLAUDY,
Managing Editor, American Inventor.

A SOURCE OF VALUABLE INFORMATION.

I wish to express to you my appreciation of the American Telephone Journal. It is a source of valuable information that no telephone man can afford to be without.
L. S. HUBBELL,
Supt. Chagrin Falls Telephone Co.,
Chagrin Falls, Ohio.

BEST WISHES FOR SUCCESS.

I find your Journal a great help in our telephone work.
H. L. OLDFATHER,
Pres. People's Mutual Telephone Co.,
Silver Lake, Ind.

OUTRANKS ALL OTHERS.

Your publication, the American Telephone Journal, outranks all competitors. No telephone company should be without it.
C. M. MCFARTRIDGE,
Gen. Mgr. Moravia Telephone Co.,
Moravia, Iowa.

ONLY READS THE AMERICAN TELEPHONE JOURNAL.

I take three telephone journals and yours is the only one that I find time to read. It is a complete telephone journal and I look forward for the time of its delivery the same as I would for a letter from home.
J. K. JOHNSTON,
Mgr. Fayette Home Telephone Co.,
Lexington, Ky.

THE JOURNAL IS WELCOME.

Your Journal always is welcome here. I do not remember receiving a single number that did not contain much valuable information both to the employer and the employee. We regard the Journal as one of the necessities in our business.
GEORGE H. FISTER,
Secy & G. M. Home Telephone Co.,
Elkhart, Ind.

EVERY ISSUE OF VALUE.

We find a great deal of valuable information in every issue of your Journal.
GEORGE A. HOLDERNESS,
G. M. Carolina Tel. & Teleg. Co.,
Tarboro, N. C.

THE BEST FROM A MANAGER'S STANDPOINT.

It is our opinion that your magazine, from a manager's standpoint, is the best that comes to our notice.
F. H. STOW,
G. M. Columbia Telephone Co.,
Portland, Oregon.

FROM THE SECRETARY OF THE INTER-STATE TELEPHONE ASSOCIATION.

I have long since learned to appreciate the American Telephone Journal.
E. M. COLEMAN,
Secy. Louisville Home Tel. Co.

EXPONENT OF UP-TO-DATE, INDEPENDENT TELEPHONY.

The Independent telephone men of the United States will recognize in your Journal the real exponent of up-to-date Independent telephony.
CHAS. E. WELLS,
Secy. Kansas Independent Telephone Association.

HAVE BEATEN OUR OWN RECORD.

You have beaten every one else for some time and in your issue of December 6th you have beaten your own record.
J. MERRILE LORD,
Treas. Ossipee Valley Telephone & Telegraph Co.,
Cornish, Me.

A VALUED FRIEND.

The American Telephone Journal is indeed a valued friend and practically indispensable to the wide-awake telephone manager, trouble-man and lineman.
FLOYD O. WAITE,
Supt. Northeastern Construction Co.,
Watertown, N. Y.

AN EXCELLENT PAPER.

I think the issue (December 6th) is an excellent one, containing many useful and practical articles and quite in keeping with the standard of excellence so long held by your paper.
F. A. DEMAREST,
Gen. Supt. Inter-State Tel. Co.,
Trenton, N. J.

FROM A CONSTANT READER.

The writer has been a constant reader of your Journal and has gained much valuable information from it. It ranks with any trade journal published, and in our opinion is the most helpful one to the Independent telephone business.
R. E. ASHBROOK,
Vice-President and Gen. Mgr. People's Ind. Tel. Co.

VALUABLE TO ENGINEERS AND OPERATORS.

The value of your paper to engineers and operators cannot but be appreciated.
F. C. BURNS,
Pres. American Electric Telephone Co.,
Chicago, Ill.

OF GREAT VALUE TO TELEPHONE WORKERS.

I have been a subscriber to the American Telephone Journal for about one year and I think it is of great value to all telephone workers. I regard it as A No. 1.
E. J. MOORE,
Secy. Farmers' Telephone Co.,
Van Voorhis, W. Va.

FOREIGN CURRENTS

THE principal telephonic subject of interest in the foreign electrical journals is the discussion of the famous Tunbridge Wells municipal system and its proposed sale to the National Telephone Company. There having been three deputations to the Postmaster-General on the subject, a protest meeting of representatives of municipalities interested in the telephone question and much correspondence in the papers, interviewing and so forth, pretty nearly everybody has had his say, and the decision of the Postmaster-General is now awaited with interest by all concerned. As the *London Electrician* says: "The question has grown to be more than a merely local one, for the result of the skirmish at Tunbridge Wells will have its effect on competitive telephony throughout the kingdom. Briefly, the case may be put as follows: The Tunbridge Wells municipal telephone undertaking is in financial difficulties, and the council desires to accept the offer of the National Telephone Company (with which company it has been competing during the last year) to buy up its telephone system for \$140,000, a sum exceeding by \$15,000 what the system has cost to erect. As a result of the Tunbridge Wells Corporation obtaining a telephone license up to the year 1925, the National Company's Tunbridge Wells license is, in accordance with the Telegraph Act of 1899, prolonged from 1911 to that date, and therefore the result of the transfer would be that the company would be left in sole possession with an extended license."

* * *

The *Electrician* points out that an alternative proposal has been made that the Post Office buy the municipal system, but as the Postmaster-General stated, the Government could hardly make as good an offer as the company had made for a business that is avowedly running at a loss. The *Electrician* then suggests a third alternative, that the Post Office take over both the systems at Tunbridge Wells. "Although the original license of the National Telephone Company for the whole United Kingdom does not expire until the year 1911, there were certain periods set down at which the Government can buy up the undertaking compulsorily at a price determined by arbitration. The last date at which this can be done is December 31, 1904, and presumably it is in no way affected by any extension of the license. Thus the Post Office can solve the difficulty by giving the requisite six months' notice to purchase the National Telephone Company's Tunbridge Wells undertaking by arbitration on that date—the intervening eighteen months will be none too long for the preliminary discussion before the necessary arrangements can be made for the transfer." The *Electrician* thinks that the taking over of the two concerns would avoid loss both to the Tunbridge Wells rate-payers and to the Post Office, though why it thinks so is not quite clear, as if the Post Office gives full price for both concerns it must lose money, and if it does not the present owners must. The *Electrician* further thinks that if such a transfer were made in every part of the United Kingdom the country might at last have a telephone system as excellent as its present telegraph service.

* * *

It is more than doubtful whether a Government monopoly would be much more successful in developing the telephone in Great Britain than a private monopoly has been, but in any case the Government is no more eager now, by all accounts, to buy up the system of the National Telephone Company than it has been in the past, and its hand is hardly likely to be forced by the little skirmish at Tunbridge Wells. The trouble with Tunbridge Wells seems to have been that it went into the telephone business without in the least understanding that business. From the voluminous history of the system set forth by the town council in support of its decision to sell the system, it is evident that the council was led to believe that for a certain sum of money it could get a complete system, sufficient for the needs of the town and capable within a short time of producing a revenue, at very low rates, sufficient to meet all expenses and interest charges, with something over in the way of profit balance. The council seems to have looked at the proposed investment in a telephone

system somewhat as if, say, an office building were contemplated which could be built for a certain fixed sum and when completed and occupied would bring in a certain fixed revenue, everything being capable of very close estimate.

* * *

Needless to say, those who regarded a telephone venture in this way very soon were undeceived. They found that a telephone system, unlike a building, was never finished; that it constantly called for fresh expenditure of capital, and that the estimates as to the actual cost of the work and the revenue obtainable were by no means always safe guides to swear by. As at the best a very narrow margin of profit had been allowed for, and as the council had been led to extend its system to neighboring villages, involving long lines and numerous small exchanges to serve unprofitable subscribers, the situation soon became discouraging. There had always been opposition to the action of the council in taking up the telephone business, and the second loan of \$75,000 was obtained only after a stiff fight at a public inquiry; so that, when it became clear that still a third loan would be required, and at the same time the telephone manager's report showed that the business was not paying a substantial profit, it is not to be wondered at that the council became discouraged at the course of their telephone business taking such a very different turn from what they had counted on. The offer of the National Company to reimburse the whole cost of the system was naturally jumped at.

* * *

The National Company has got full value for the \$140,000 it has agreed to pay for the Tunbridge Wells system, as the setback given to municipal telephone competition all over the country by the publicity of the acknowledged failure at Tunbridge Wells is probably well worth the money, even if the Tunbridge Wells plant is not. If municipal telephone systems in England are to be successful, they must be planned on very different lines from those adopted at Tunbridge Wells. There are three cardinal points that seem to have been ignored. The first is that low rates will by themselves cause a large development, and that this development must be planned for from the beginning; the second is that in planning for development capital must be spent ahead of immediate requirements, which makes the figures for average cost per line, on which the English telephone men seem to base all their arguments, wholly illusory; the third is that very low message rates and very low flat rates do not work well together, especially where there are competing systems.

* * *

If the municipalities contemplating the establishment of telephone systems take the lesson of Tunbridge Wells thoroughly to heart, there is no reason why they should not be successful with the telephone business. They have many advantages on their side, cheap money, entire control of the streets and local sentiment. Whatever opposition there is, is generally factitious, and no doubt assiduously fostered by the National Telephone Company. That is quite obvious from the history of the Tunbridge Wells case, and, moreover, it is perfectly natural that the National Telephone Company should do everything in its power to protect its own business. But starting out with proper plans, with the object of attaining a large development and with a thorough knowledge of the correct methods to follow in order to attain that development and to provide for it, there is no reason why the municipal telephone systems should not be successful. The planning and the managing of the business according to up-to-date telephone methods are the important points. The English municipalities are evidently not acquainted with up-to-date telephone methods, nor do they appreciate how great a field there is for telephonic development. Their one idea seems to be simply to duplicate the existing system at a somewhat lower rate. Success does not lie in that direction. If a few American ideas of telephone equipment and management were imported, there would soon be a very different story to tell.

The Arrestor.

POLE LINE CONSTRUCTION—ARTICLE IV.

By J. W. LATTIG, General Superintendent of the United Telephone and Telegraph Company, Philadelphia.

AT line terminals, the cross-arms of the last two poles shall be placed on the side of the pole facing the terminals.

On curves, the cross-arms shall be placed on the sides of the poles facing towards the middle of the curve.

At road crossings, the cross-arm shall be placed on the sides of

LOCATION OF WIRES.—On straight lines, the wires shall be tied to the insulator in the position shown at "A" in Fig. 51.

On curves, the wires shall be tied to the insulator in the position at "B," Fig. 51.

METHODS OF TYING WIRES.—The line wires shall be tied in a

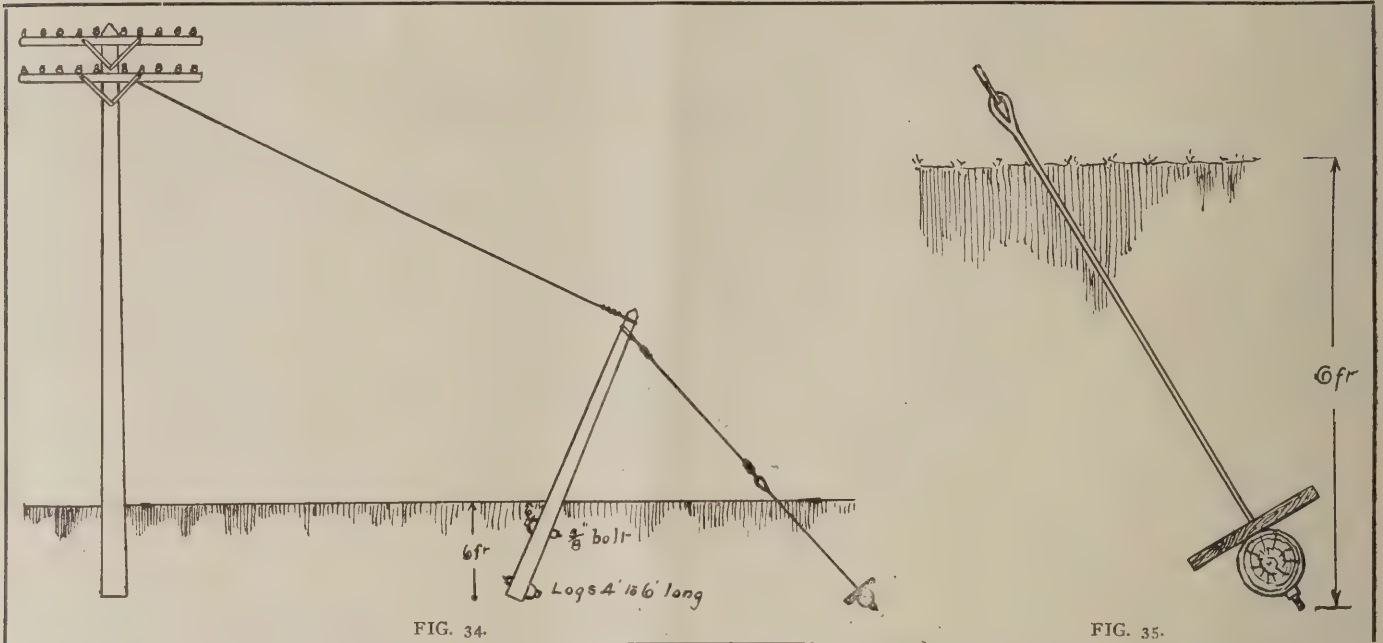


FIG. 34.

FIG. 35.

the pole facing toward the road. See Figs. 43 and 44.

SAG OF WIRES.—String wires so that the sag shall be as given in the following table, making allowance therein indicated for temperature and length of span.

manner shown in Fig. 49. It will be noticed that one side of the tie wires passes over the line wire and makes five complete turns, and the other side passes under the line wire and makes five complete turns.

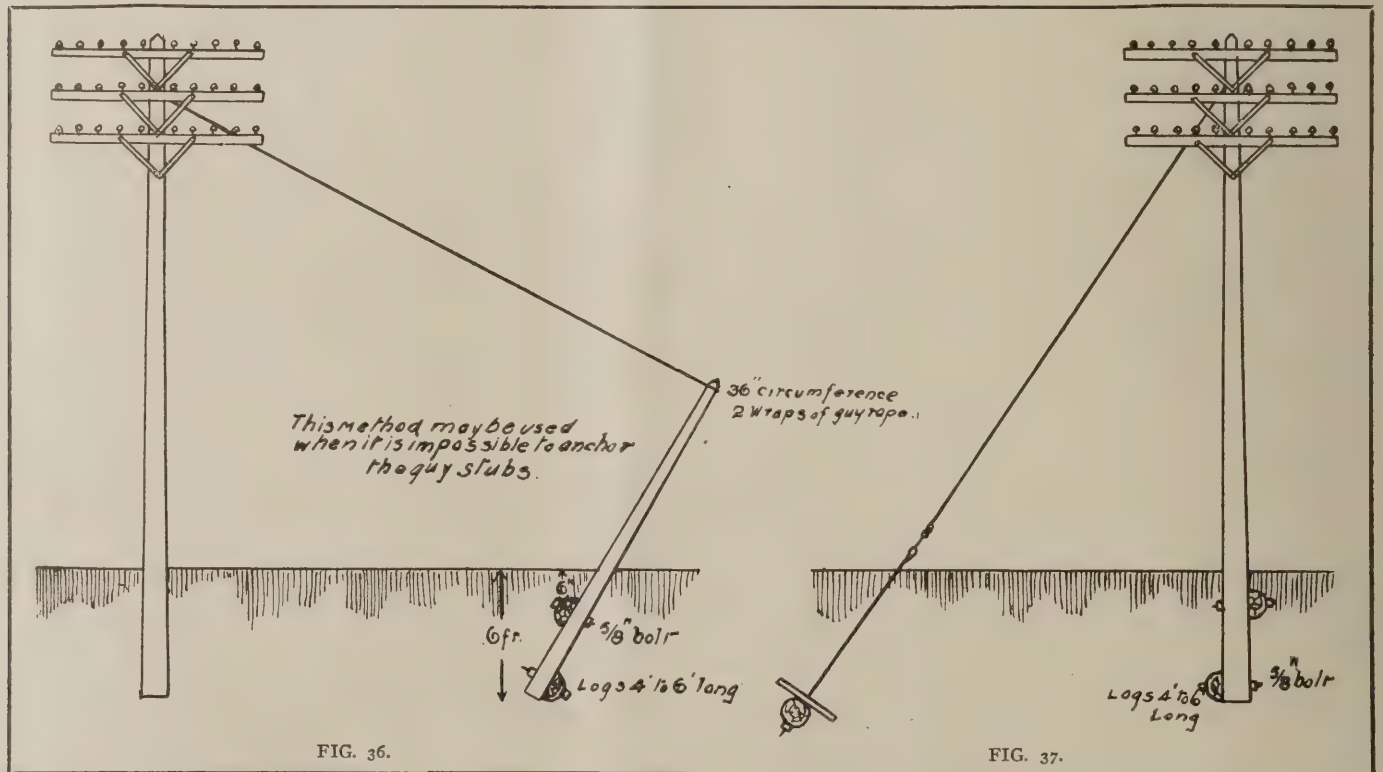


FIG. 36.

FIG. 37.

SAG EXPRESSED IN INCHES.

Temp., Fahr.	Span 75	Span 100	Span 115	Span 130	Span 150	Span 200
	ft. sag.	ft. sag.	ft. sag.	ft. sag.	ft. sag.	ft. sag.
Deg. 30 below.....	1	2	2½	3¾	4½	8
Deg. 10 below.....	1¼	2¼	3	3¾	5	9
Deg. 10 above.....	1½	2½	3½	4¾	5¾	10¼
Deg. 30 above.....	1¾	3	4	5½	6¾	12
Deg. 60 above.....	2½	4¼	5½	7	9	15¾
Deg. 80 above.....	3¾	5¾	7	8¾	11¼	18¾
Deg. 100 above.....	4¼	7	9	11	14	22¼

JOINTS.—The joints in the copper wire shall be made with McIntire sleeves, each sleeve for No. 10 and 12 B. & S. having three complete twists, as shown in Fig. 15.

TRANSPOSITIONS.—The system of transposition to be followed is shown in Fig. 52. The detail method for making a transposition is shown in Figs. 45, 46, 47, and 48.

In locating transposition poles, proceed as follows: Measure a distance of 1,300 feet from the first open wire fixture and mark the pole nearest the point so measured "A." Measure a second distance of 1,300 feet from the first 1,300 foot pole and mark the pole nearest that point "B." Measure a third distance of 1,300 feet from the second 1,300 foot pole, and mark the pole nearest

the point "C." Continue in this manner to measure off poles 1,300 feet apart, marking the poles as shown in Fig. 52.

DEAD ENDING.—In attaching the wire to the last insulator on the line at any point where a run-in is to be made to an office or cable, a half sleeve shall be used, as shown in Fig. 50. One and one-half twists shall be given the half sleeve.

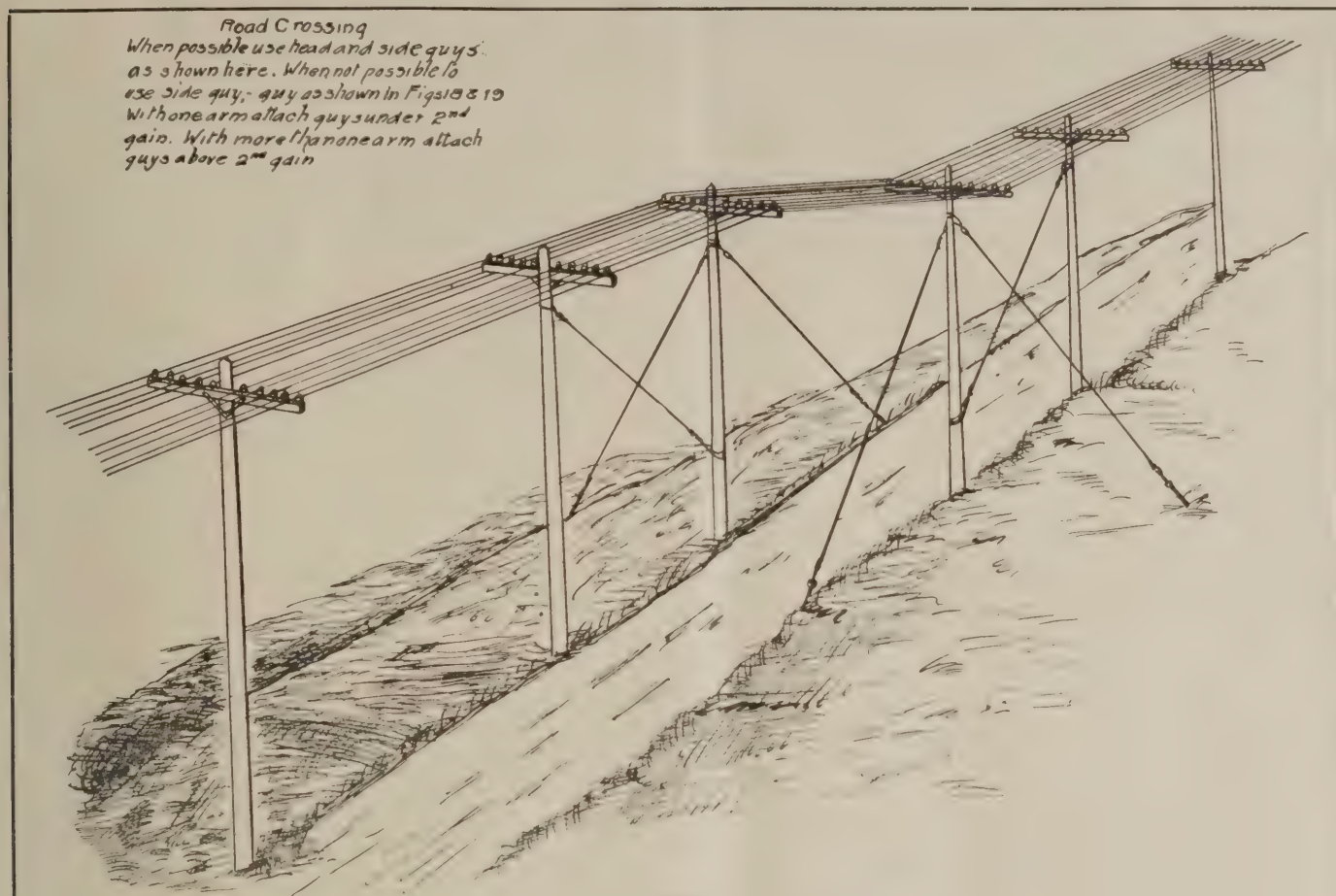


FIG. 38.

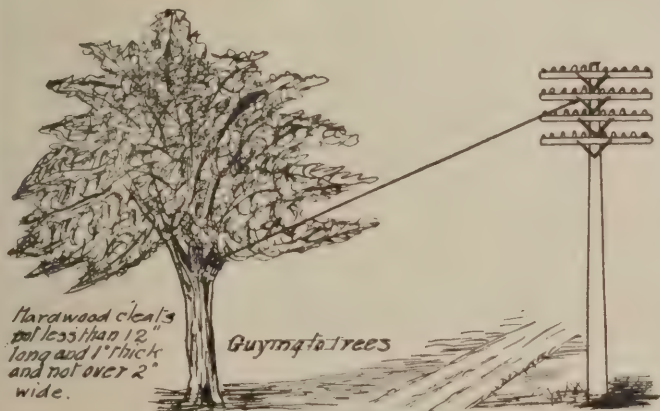


FIG. 39.



FIG. 40.

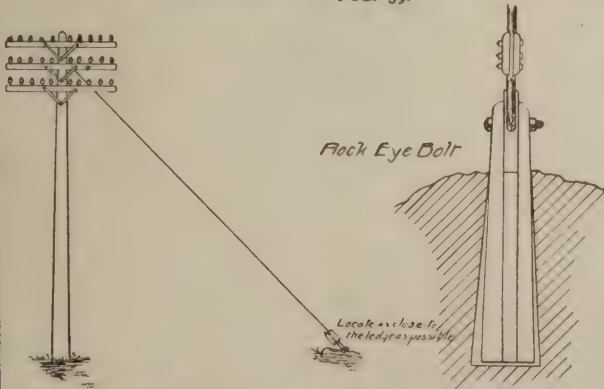


FIG. 41.

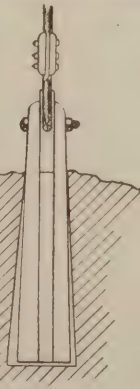
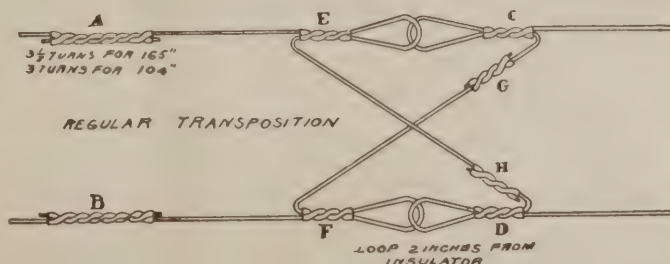


FIG. 42.



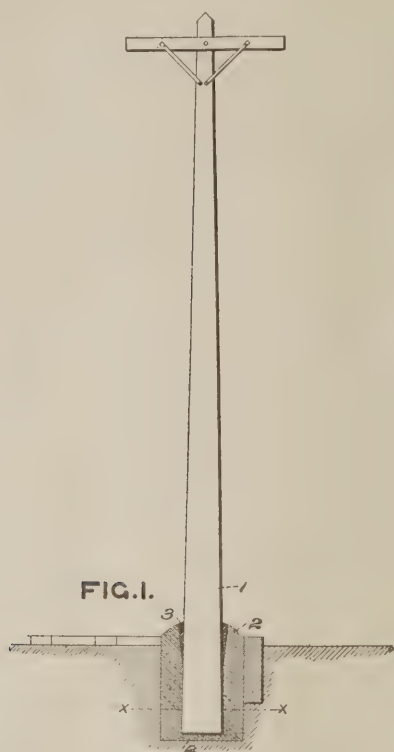
POLE TRANSPOSITION

REGULAR TRANSPOSITION

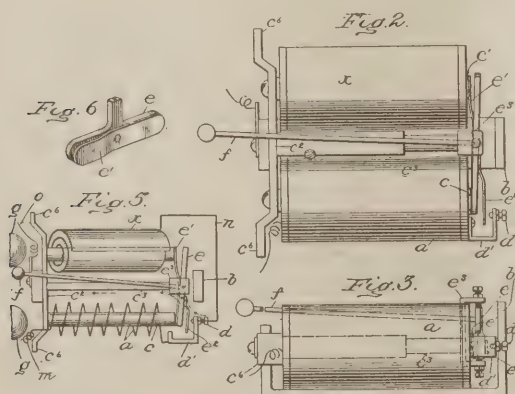
FIG. 45.

Patents

Harry Etheridge, of McKeesport, Pa., patents (No. 715,362) a method for preserving wood or iron poles and timbers. This device is shown in Fig. 1, from which it will be seen that the



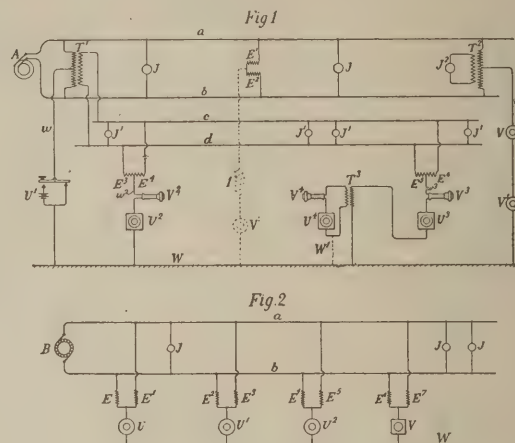
pole is set in a matrix of concrete having a conical mouth 3, into which the inventor proposes to pour pitch, tar or other preservative compound.



C. E. Egan, of Durham, N. C., patents (No. 714,681) a signal-bell for telephone systems. The device is shown in plan in Fig. 2 in side elevation in Fig. 3 and in detail in Fig. 5. The essence of the invention is a method for combining the ringer and condenser in one piece of apparatus. This is illustrated in Fig. 5. One-half of the ringer magnet is made in the ordinary manner

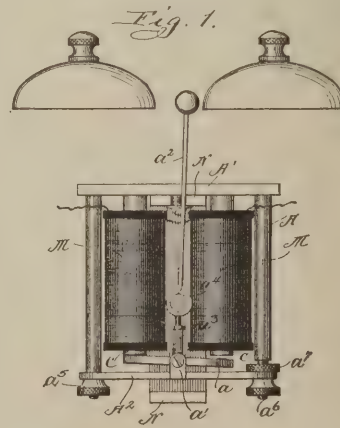
and wound as shown at A and C; on the other spool tin-foil is used as shown at X, thus securing a certain amount of capacity. By means of the contact d on the spring E² a vibrating contact is secured due to the operation of the ringer armature. Thus this device alternately cuts the condenser in and out of circuit.

Frederick Bedell, of Ithaca, N. Y., patents (No. 715,537) a composite system of electrical transmission. This invention is a method of telephoning simultaneously over circuits carrying continuous or alternating currents of considerable volume. The essence of the patent is shown in Fig. 1 and is a further extension and development of a patent of somewhat similar nature granted to the author about two years ago. In Fig. 1, A is a dynamo machine supplying the circuits a and b at any number of points



along this line. High resistance coils are bridged as at 7¹ and 7². These coils form one side of a transformer, the other side of which is connected to any supplementary line, such as C and D, from which telephone or telegraph instruments may be taken off and run either to ground for the other half of the circuit or to a return wire. Under these circumstances, the high tension lines A and B act as one-half of the telephone circuit, and it is possible, by carefully balancing the transformers 7¹ and 7² to make the lines noiseless. The remainder of the patent is devoted to modifications of fundamental ideas, such as the construction of coils and transformers, to secure the best results.

William E. McCormick, of Chicago, Ill., patents (No. 715,683), and assigns to the International Telephone Manufacturing Company, an electrical call bell. This device is illustrated in Fig. 1. The improvement claimed in this invention lies chiefly in the method of adjusting the position of the armature with reference



to the ringing magnets. This is accomplished by supporting the armature on a plate A² rigidly attached to one side of the ringer frame by a nut A⁶ and adjustably supported to the ringer frame 5 by the nuts A⁶ and A⁷. The inventor also introduces a coil in the clapper wire A⁴, whereby greater springiness is claimed for improving the tone of the ring.



New Companies

BUNKERHILL, ILL.—The farmers between Bunkerhill and Shipman are preparing to organize an Independent telephone line to connect the two towns.

SIBLEY, ILL.—The Sibley Telephone Company has been incorporated with a capital stock of \$4,000. The incorporators are: W. R. Hamilton, A. A. Absher, F. A. Warner.

BORDEN, IND.—The Daisy Telephone Company, of Borden, has been incorporated, with a capital stock of \$2,000. The incorporators are W. H. Porter, W. E. Gray, D. M. Gray, C. F. Gray, B. F. Stalker, Wm. Stone, Wm. Rosenberger, Ben Schmidt, Chas. Huber, W. B. Horsell, J. W. Durham and A. S. Gray.

NINE MILE, IND.—The Nine Mile Telephone Association of Allen County has been incorporated with a capital stock of \$10,000. Incorporators: F. T. Kinerk, of Ft. Wayne; Frank P. Harber, of Sheldon; J. Robert King, of Nine Mile; George Coverland and James F. Fell, of Fort Wayne.

BURLINGTON, IA.—The Burlington and Augusta Telephone Company, of Burlington, has been incorporated with a capital stock of \$5,000. E. Rankey, president, and N. C. Hansen, secretary.

GREENVILLE, MAINE.—The Chamberlain Lake Telegraph and Telephone Company, of Greenville, has been incorporated with a capital stock of \$10,000. Incorporators: L. H. Folsom, president; H. M. Shaw, treasurer, both of Greenville.

HYANNIS, MASS.—Citizens of Hyannis are considering the establishment of an Independent telephone company, as it is stated that the company which now has the field is inclined to overlook some of its original stipulations.

MANSFIELD, MASS.—At a recent meeting of the Board of Trade the idea of a local telephone system was discussed, and it is probable that either the old company that was started some time ago, or a new one will be organized to put it through.

RAISEN CENTER, MICH.—A new telephone company has been organized here with central office in Holloway. L. C. Chase is president; J. L. Richard, secretary, and J. B. Nixon, treasurer.

LEBANON, N. J.—The Lebanon Telephone Company has been incorporated with a capital stock of \$5,000. Incorporators: George Clark, S. J. Shurts, A. W. Sutton, G. B. W. Tiffany.

BAINBRIDGE, N. Y.—The Riverside Telephone Company has been organized to run a line from Sidney to Bainbridge. The work of carrying out the project will commence at once. Alonzo Lilley is president of the company, Chris. Tobey, treasurer and Freemont Bentley, secretary, all of Bainbridge.

JAMESTOWN, N. Y.—The Chatauqua Telephone and Telegraph Company of Jamestown has been incorporated with a capital stock of \$20,000. Directors: T. S. Lane, Lillian P. Lane, B. D. Phillips, E. B. Crissey and F. H. Mott, of Jamestown; G. W. Appleby, of Watts Flats, and E. W. Scowden, of Frewsburg.

Rates

FRANKFORT, IND.—The Central Energy Telephone Company, of Frankfort, is endeavoring to secure permission from the town council to increase its rates to \$1 for residence and \$2 for business telephones. If successful it will at once expend about \$30,000 in improving the system. This will include putting many wires underground and a 500 line additional switchboard equipment.

KOKOMO, IND.—The Independent Telephone Company, of this city, has advanced its rates for private houses to \$1.50 a month, an increase of 25 cents.

JEFFERSON CITY, MO.—The Capital Telephone Company is circulating a petition asking the city council to grant it permission to raise rates of service from \$2 to \$2.50 on business telephones and from \$1 to \$1.25 for residences. The general sentiment among telephone users is that the petition should be granted, as the company is giving excellent service.

Competition

ELKHART, IND.—As a result of the meeting of the South Bend Merchants' Association and business and professional men who are not members of the association, a petition will be circulated among South Bend merchants asking them to agree to take out of their places of business the Bell telephone.

TRUMAN, MINN.—The Twin City Telephone Company is contemplating putting in a line at Anoka to compete with the Northwestern.

COOPERSTOWN, N. Y.—Over fifteen business houses and offices in Cooperstown and vicinity have notified the Central New York Telephone and Telegraph Company to remove the Bell telephone from their places of business on or before Jan. 1.

Combinations

WABASH, IND.—The Bippus telephone plant has been sold to J. L. Schwartz, of the Luther Telephone Company, and the two plants will be consolidated.

BURLINGTON FLATS, N. Y.—A telephone meeting was held here recently at which it was voted that the several lines entering the city should be incorporated into one company.

Elections

BLOOMINGTON, ILL.—The stockholders of the McLean County Telephone Company held a meeting recently at which Henry Throbro and George Bohrer were elected to the board of directors, and Mr. J. J. Pitts was appointed as a member of the auditing committee.

SOUTH PARIS, ME.—The stockholders of the Citizens' Telephone Company have elected these officers: R. L. Cummings, president; J. G. Littlefield, clerk; A. H. Jackson, treasurer; W. N. Thomas, O. K. Clifford, Wm. Caldwell, J. H. Record, H. B. Sturtevant, directors. The company's lines are now nearly completed, covering about 25 miles in all.

SOUTH PARIS, ME.—The Curtis Hill and Paris Telephone Company at its annual meeting elected these officers: Dr. F. H. Packard, president; W. H. Lurvey, secretary and line superintendent; F. L. Wyman, treasurer; Dr. Packard, A. J. Abbott, O. G. Curtis, Charles S. Dudley, R. L. Cummings, directors.

CHERRYVILLE, N. J.—The Cherryville Telephone Company has elected the following officers: S. K. Everett, president; A. E. Finn, secretary; A. J. Pierson, treasurer.

HANCOCK, N. Y.—At a meeting of the Hancock Telephone Company, Arthur S. Pierson, of Apex, was elected president and Lewis Kleinle, vice-president.

Financial

MASCOUTAH, ILL.—The Mascoutah Electric Light Company will increase its capital stock from \$5,000 to \$7,500, and will construct a local telephone system, for which a franchise has been granted by the city council.

BOSTON, MASS.—The directors of the American Telephone and Telegraph Company have declared the regular quarterly dividend of $1\frac{1}{2}$ and an extra dividend of three-fourths of 1 per cent.

BOSTON, MASS.—The Mexican Telephone Company reports for October:

	1902.	1901.	Increase.
Gross earnings.....	\$21,179	\$18,047	\$3,132
Operating expenses.....	10,686	8,773	1,913
Net earnings.....	\$10,493	\$9,274	\$1,219
For eight months ended October 31:			
Gross earnings.....	\$161,116	\$140,707	\$20,409
Operating expenses.....	87,492	77,308	10,184
Net earnings.....	\$73,624	\$63,399	\$10,225

BOONVILLE, N. Y.—The Black River Telephone Company, of Boonville, has increased its capital from \$25,000 to \$50,000. The \$25,000 increase is preferred as to dividends at the rate of 5 per cent per annum, the

THE WEEK'S MESSAGES *Continued.*

dividends being cumulative and payable semi-annually, but the stock is without voting power.

COOPERSTOWN, N. Y.—The Cooperstown Telephone Company has paid its first dividend of 3 per cent for the past six months on preferred stock.

CORTLAND, N. Y.—At a meeting of the stockholders of the Cortland Home Telephone Company it was voted to increase the capital stock of the company from \$75,000 to \$125,000. This increase has become necessary owing to the greatly increased business of the company and the extension of its lines.

MASSENA, N. Y.—The St. Lawrence Telephone Company of this city has increased its capital stock from \$25,000 to \$50,000.

HAMILTON, OHIO.—The Hamilton Home Telephone Company has filed a mortgage in favor of the Cincinnati Trust Company for \$200,000. It was given to secure the payment of 300 first mortgage five per cent. gold bonds of \$100 each and 300 first mortgage five per cent. gold bonds of \$500 each, \$160,000 of which is to be used for the completion of the plant.

PHILADELPHIA, PA.—The Bell Telephone Company of Philadelphia has declared a dividend of 2 per cent.

FOND DU LAC, WIS.—The Little Wolf River Telephone Company is to be reorganized. Its capital stock is to be increased from \$125,000, the present amount, by probably \$50,000 or \$75,000, the actual increase still being a matter of speculation. The increase will be sufficient, however, according to emphatic statements of the stockholders, to tide the concern over its present financial embarrassment and place it upon a good business basis. The plan proposed gives every shareholder in the new concern an equal amount with that he is now holding. Many stockholders have promised to double their stock in the new company. The president, C. E. Plum, has been authorized to appoint a committee on solicitation, to solicit subscriptions for additional stock. The meeting for reorganization will probably not be held until the committee on solicitation has had due time to proceed in its work. According to the stockholders' views, there is no call for summary action, as the creditors, it is said, are all willing to wait for the company to take any action desired. The company, according to its books, has an increasing and paying business, its annual profits averaging between 5 and 7 per cent.

Franchises

FRANKLIN, CAL.—F. W. Ehrhardt, secretary of the Glendale Creamery, nine miles south of this city, has asked the board of supervisors for a franchise to construct a private telephone line along the highways of the county.

CHICAGO, ILL.—Representatives of the United Telegraph, Telephone and Electric Company, a prospective rival of the Chicago Telephone Company, urged the committee on gas, oil and electric light to take speedy action on an order, which, if sanctioned by the council, will give the company a foothold in Chicago's business district and will permit the Independent companies in Illinois and adjacent States to get into communication with this city. If the order is passed, the company will probably make a deal for the use of the conduits of the Illinois Telephone and Telegraph Company.

MARION, IND.—A franchise has been granted by the City Council to the Citizens' Co-operative Telephone Company, of Fairmount. The officers of this company are: M. A. Beasley, president; Ancil Ratliffe, vice-president and secretary; Aaron Newby, treasurer.

VINCENNES, IND.—A franchise has been granted to X. Y. McGregor, of this city to construct and operate a telephone system in Mt. Vernon, Indiana.

CEDAR FALLS, IA.—Cedar Falls will soon be made the terminus of an Independent telephone systems operated by farmers and now maintaining an exchange at Hudson. The system has now absorbed five lines and covers the farming district of Black Hawk and Eagle townships. For some time the farmers have been desirous of gaining a connection with Cedar Falls and have been working with that end in view. They will ask for a franchise to enter the city, and no doubt it will be readily granted, as it will bring greater advantages to the business interests of this city, giving the business houses connection with all this country south and making it possible to talk to the prosperous farmers in their homes. A large number of the patrons of the system are stockholders and they have found the telephone almost indispensable in keeping track of the markets, ordering goods, etc.

MONTEZUMA, IA.—A special election has been called for Jan. 5, at which the citizens of this town will vote upon the question of granting a franchise to the Keokuk, Mahaska and Poweshiek Mutual Telephone Association, giving the right to erect and maintain poles and lines on the streets and alleys in the town of Montezuma for telephone purposes.

SIOUX CITY, IA.—The syndicated Independent exchanges and local exchanges have applied to the Council for a franchise to construct a system here. They propose to construct a \$250,000 system; put construction underground in business districts, and a capacity of 5,000.

HAMILTON, MONT.—The Bitter Root Telephone Company, recently organized, has filed a petition with the board of county commissioners asking for a 50-year franchise. The route of the proposed line as given in the

petition is south through Grantsdale, Como and Darby, up the Bitter Root Valley and up the west fork of the Bitter Root River to the south fork of the west fork, and thence up the south fork to Hughes creek; thence up Hughes creek to the south fork of that creek, and thence up the south fork to the State line between Montana and Idaho, and by a certain described route in Idaho to a point in Lemhi county, Idaho. There will be a branch line running from the south fork of Hughes creek up Hughes creek to the head of said creek. The organizers propose to have the poles for the line cut and hauled during the winter, so that as soon as the weather permits in the spring the work of construction may begin.

RIVERTON, N. J.—The Eastern Telephone Company has applied to the Council for permission to operate its line in the borough.

GRAND FORKS, N. D.—E. H. Moulton, president of the Twin City Telephone Company and the Consolidated Telephone Company, and treasurer of the Minnesota Valley Telephone Company, has applied for a franchise to install a line here.

PHILADELPHIA, PA.—The electrical committee of council has favorably reported an ordinance granting extensive privileges to the Keystone Telephone Company. The original ordinance, under which the company is now operating, was granted to a New Jersey chartered company. With its new privileges the company will have the right to construct its system in any part of the city, and will be relieved of an obligation to repave streets except directly over its trenches.

SOUTH BETHLEHEM, PA.—The town council has in consideration a franchise to the Lehigh Telephone Company to string its wires in the streets of the city. Work must be commenced within thirty days from the passage of the ordinance, and the work is to be completed within ninety days. The company is to deposit a \$5,000 bond as a surety for complying with the franchise, and shall pay \$1,000 in consideration of being granted the franchise privileges. One of the terms of the ordinance is that the wires are to be put underground at any time the council orders such work done.

OGDEN, UTAH.—The Utah Home Telephone Company, which was recently granted a franchise in Salt Lake City, has presented a petition to the city council asking for a franchise here.

FARMVILLE, VA.—The Union Telephone Company, composed of local citizens, has applied to the town council to construct and operate a system here. This company already has connections with nearly every important point in this vicinity. It is understood a franchise will be granted, provided the company does not interfere in any way with the rights granted the Farmville Telephone Company.

JEFFERSON, WIS.—Frank P. Mansfield, of Lake Mills, has been granted a franchise to construct and operate a telephone system here.

Underground

NACOGDOCHES, TEXAS.—The Commercial Telephone Company of this city will put its wires underground.

RICHMOND, VA.—President Addison Maupin, of the Richmond Telephone Company, has filed notice of acceptance on the part of his corporation, of the franchise granted by the city council three months ago, the chief provision of which is that the company shall place its wires underground in a certain business section of the city. A bond to indemnify the city against loss was also filed. President Maupin states that the work of constructing the conduit system will be begun immediately and pushed to rapid conclusion.

Construction

CANTON, ILL.—A large force of men are at work for the Canton Home Telephone Company, putting in the underground conduits, setting poles and laboring in various ways on the preliminary preparations. It is expected to have the system in operation about March 1. The conduits are being placed on a concrete bottom, eighteen inches under the pavement. They will have a capacity of 3,000 wires.

CHAMPAIGN, ILL.—The Home Telephone Company, of Champaign County, is preparing to extend its toll lines further into the surrounding country and also to build new lines to several towns.

CHENOA, ILL.—The South Chenoa Telephone Company is extending its lines west of here about four miles.

LINCOLN, ILL.—At the meeting of the Logan County Farmers' Institute held here recently, several members drew plans for constructing a country telephone system.

OGDEN, ILL.—The Farmers' Mutual Telephone Company will soon commence the construction of a line from here to Gifford and Penfield.

FRICHTON, IND.—The Frichton Independent Telephone Company is buying supplies to extend its system into Wheatland and the surrounding country.

SALEM CENTER, IND.—The Farmers' Telephone Company has installed a new switchboard and transfer station here.

THE WEEK'S MESSAGES Continued.

TERRE HAUTE, IND.—The Kinloch Telephone Company has been awarded a franchise to build its lines through Vigo County. It now has a large number of men working on the line in Illinois and the management has assured the Citizens Telephone Company of this city that an all metallic circuit would be established between Terre Haute and St. Louis by Jan. 1. The Citizen's Company is said to be 250 orders behind, and it is impossible to secure enough linemen to do the work on city lines. A line to Brazil, via Seeleyville, is under course of construction and within a few weeks work will be begun on the Fontanet line.

ALBERT, KAN.—The Rock Telephone Company, with headquarters here, contemplates constructing a toll line south from here connecting several other towns in this vicinity.

AUBURN, KY.—A telephone line is being constructed by C. M. Ray from Stewers to Auburn.

PAINTSVILLE, KY.—The Inter-State Telephone and Telegraph Company has a force at work putting in poles for its line from Prestonsburg to Whitehouse. The company is putting up a good telephone line from Whitehouse to Pound Gap, in Virginia. The line has been completed from Prestonsburg to Pikeville and the remainder of the line will be up in a few days. The line passes through Paintsville. It is reported that the line belongs to the Northern Coal and Coke Company.

MANSFIELD, MASS.—The Board of Trade is considering a plan of establishing a local telephone system. The Southern Massachusetts Telephone Company contemplates advancing the rate for local service from \$18 a year to \$24.

PITTSFIELD, MASS.—The rural telephone company will construct a line through W. Stockbridge Center.

BATTLE CREEK, MICH.—The directors of the Calhoun County Telephone Company held a meeting recently at which it was announced that the Citizens' Telephone Company of Grand Rapids would take all the preferred stock of the local company and furnish the money necessary to enlarge the capacity of the plant. A new switchboard and additional underground cables are some of the improvements contemplated in the near future. The new toll line connecting this city and Marshall has been opened to the public.

BATTLE CREEK, MICH.—A project is on foot to institute a rural telephone line into this city from various adjacent townships.

CADILLAC, MICH.—Edmund Land, of the Citizens' Telephone Company of Grand Rapids, was here recently with a view to making some improvements and extensions.

BILLINGS, MONT.—The Montana and Wyoming Telephone Company, with headquarters at this place, will soon have a system installed at Basin, Wyo. The line is already running into Basin. The circuit is being completed and material has been ordered for the local system at that place. Twenty-eight subscribers have been secured.

BEATRICE, NEB.—A large force of men are at work constructing the lines of the Independent Telephone Company to this city from the southern part of the county and will soon have its lines in operation pretty generally throughout the country.

YORK, NEB.—The stockholders of the York County Telephone Company held a meeting recently in York, and effected a reorganization of the company, and elected the following board of directors: N. Beaver, J. W. Straight, J. B. Erwine, M. H. Kirkpatrick, A. B. Christian, Geo. H. Holdeman and J. M. Bell. The new board held a meeting and elected the following officers of the company: President, Geo. H. Holdeman, York; vice-president, Commodore N. Beaver, Waco; secretary and manager, W. E. Bell, York; treasurer, J. M. Bell, York. The company has already made quite extensive plans for extending the lines and business, and has bought the plants of the Waco Telephone Company and the Benedict Telephone Company and made a traffic agreement with the Bardshaw Telephone Company, so that it now owns and has direct connection with over 300 subscribers in York County. It is the intention of the company to install an extensive exchange in York, equipped with the very best instruments and materials. It will install a central energy switchboard.

CASSVILLE, N. Y.—Arrangements have been made between the Clayville, Cassville and Paris Station Telephone Company and the Home Telephone Company for the wires of the former to be placed on the poles of the latter company, which will be done soon, and will do away with one set of poles.

CENTRALIA, N. Y.—There is some talk of a telephone line being built connecting Bemus Point with Centralia via Waterman Corners.

GLEN, N. Y.—The Glen Telephone Company is making preparations for extending its lines to nearby towns.

SYRACUSE, N. Y.—The Syracuse Telephone Company is now handling 40,000 messages per day, and it is apparent that the capacity of the plant is wholly inadequate to handle its business. Last month sixty-eight new telephones were installed. It is understood that a considerable increase in the plant is contemplated in the near future.

MANSFIELD, O.—The Federal Telephone Company will authorize the expenditure of between \$35,000 and \$40,000 on the plant at Mansfield at once. This was decided recently when a number of the directors of the

Mansfield company conferred with President Dickson and other members of the Federal Company.

NEWARK, OHIO.—The Newark Telephone Company, which is installing a new central energy system, has ordered an additional switchboard section, the new board not yet completed being inadequate to supply the demand for service.

LANCASTER, PA.—The United Telephone and Telegraph Company has begun work on a new line to be erected between Lancaster and Landisville. Communication with Landisville is at present had by way of Columbia, and the twenty or more patrons in Landisville frequently experience delay in getting Lancaster by reason of the large amount of business done on the Columbia line. This will be eliminated by the new line, which will give Landisville patrons a separate wire and direct communication. Manager W. H. Hartman will have the new line completed and in operation at the earliest day possible. It will be built along the Harrisburg turnpike.

NORTH JACKSON, PA.—The Northeastern Telephone Company will soon have first class connections with all points in the Lackawanna Valley. This is brought about by making arrangements with the Citizens' Company, which will soon be connected up to these points.

PITTSBURG, PA.—The Pittsburg and Allegheny Telephone Company is constructing a line from this city to McKeesport.

CONASAUGA, TENN.—Application for a charter for the Conasauga Telephone Company has been filed by W. Morris Harrison, Mortimer Brient, J. F. Shelton, James Curd and Dr. Jenkins. The company has already about forty-eight miles of telephone lines in Monroe and McMinn counties and will in the near future build several new lines.

CORSICANA, TEX.—The Corsicana Telephone Company has ordered material to increase its plant to a capacity of 1,000 lines.

FREDERICKSBURG, VA.—The Upper Rappahannock telephone line from Tappahannock to this city has nearly reached this city, and in a few days the line will be completed, and this city will be in telephone communication all down the Rappahannock Valley, on both sides of the river, the Northern Neck line having been in use for several years. At Port Royal the new line on the south side of the river will connect with Port Conway, on the opposite side of the Rappahannock River, in King George County.

ASHLAND, WIS.—At a recent meeting of the stockholders of the Ashland Home Telephone Company, of which Senator C. A. Lamoreux is president; J. I. Levy, vice-president, and T. C. Jacks, secretary, it was decided to push forward the toll line connection to Washburn, Bayfield and Duluth, that had been mapped out for the early spring.

Miscellaneous

DESPLAINES, ILL.—The F. E. Bell Telephone Company of this place has filed an amendment to its incorporation papers changing the name to Desplaines Telephone Company.

NORTH MAHASKA, IA.—The Farmers' Mutual Telephone Companies of Union Mills have accepted terms offered by W. E. Bryan, whereby they run their lines to the switchboard of W. E. Bryan and he does all their switching. This gives all the Mutual lines free access to the Bryan lines, and all the subscriber's on Bryan's system can talk free to the Mutual telephones connecting at New Sharon. The three companies at Lacey will be brought into New Sharon over one vacant wire connecting the switchboard at Lacey with the board here. Thus all New Sharon subscribers talk free with Lacey and vice versa. With the subscriber's now on Bryan's system with the new telephones just added, gives each one access to 400 telephones.

GRAND RAPIDS, MICH.—"The rumor that the Citizens Telephone Company at this place has decided to put in an automatic switchboard is incorrect," said a gentleman connected with the Co-operative Company. "No decision has as yet been made as to which board will be used."

CAMDEN, N. J.—The Eastern Telephone and Telegraph Company announces an extension of its service to the following points: Audubon, Collingswood, Haddonfield, Haddon Heights, Merchantville, Moorestown, Mt. Ephraim, Oaklyn, Orston, Westville, Woodbury, Maple Shade and Westmont, N. J.; Ashbourne, Conshohocken, Concordville, Coatesville, Chester, Darby, Doe Run, Downingtown, Doylestown, Dreshertown, Edgehill, Glenside, Hatboro, Honey Brooke, Jarretstown, Jenkintown, Kennett Square, Langhorne, Lansdale, Lincoln University, London Grove, Lancaster, Llanwellyn, Malvern, Marcus Hook, Moores, Media, Norwood, Norristown, Oxford, Ogontz, Parkersburg, Pennsburg, Phoenixville, Pottstown, Ridley Park, Soudertown, Spring City, West Chester, West Grove, Whitford, Wyncote, Pennsylvania; Wilmington, Delaware.

CANANDAIGUA, N. Y.—Hereafter the Canandaigua Telephone Company will be known as the Interlake Telephone Company.

MIDDLETOWN, N. Y.—A meeting of the stockholders of the Orange County Telephone Company was held here recently. Dr. Hardenbergh, the president, presided. A report of the financial condition of the company was rendered by Treasurer A. B. Wilbur. It showed the finances to be in a

THE WEEK'S MESSAGES *Concluded.*

very satisfactory condition and that nearly all of the improvements made during the past several months have been paid for. It was voted that hereafter all stockholders be charged for the use of telephones at the same rate of rental charged other subscribers.

OLEAN, N. Y.—By Jan. 1, subscribers and patrons of the Union Telephone and Telegraph Company will be enabled to telephone long distance to points east and west of this city. When the promoters of the Union system asked for a franchise to put in their system in Olean, the statement was made that they expected in time to make the system more than local. The system up to date has been extended only to Portville, Allegany, Bradford and other nearby towns, but now negotiations have been perfected whereby long distance telephoning may be done over their lines within a very short time.

TOLEDO, O.—The Central Construction Company has formally surrendered the new telephone plant to the custody of the Toledo Home Telephone Company. The Central Construction Company has built and has been operating the plant under contract with the Home Telephone Company. Another important action taken by the Home Telephone Company was the decision not to wait until January 1, when interest on the bonds mature, but to pay on Dec. 15, or a day or so later. This speaks well for the financial condition of the enterprise. There are \$1,025,000 worth of bonds outstanding, and other half a million dollars' worth are held by Toledo investors. The directors of the Home Telephone Company now in charge of the property are E. L. Barber, James S. Brailey, Jr., Marcus V. Barbour, Minot I. Wilcox, Jay K. Secor, Thomas H. Tracy, Celian M. Spitzer, James J. Robison, Daniel C. Shaw, Arthur B. Taylor and Robert E. Hamblin, secretary and treasurer.

LYKENS, PA.—The Lykens Telephone and Telegraph Company has made a traffic arrangement with the Keystone Telephone Company of Philadelphia.

DENTISTS FAVOR INDEPENDENTS.

DENTISTS of Rockford, Illinois, have decided that one telephone is enough for them and every one has had an instrument of the Home Telephone Company placed in his office. The dentists who had the old Bell Telephone in have ordered the old instrument out and now their patrons can reach them only over the new system.

TRADE NOTES

MR. R. L. FREWIN, formerly traffic manager of the Central Union Telephone Company, who during the past year has been general manager of "THE FLYING SQUADRON," has accepted the position as general contract agent of the Keystone Telephone Company, of Philadelphia, Pa. Mr. Frewin is considered the most expert telephone solicitor in the United States and holds the record of having taken 43 bona fide exchange contracts in eight hours at Peoria, Ill., an exchange which was already developed to the extent of six per cent. Mr. Frewin's position with "THE FLYING SQUADRON" will probably be filled by Mr. C. A. Kairer, who has had over eight years' experience in the business. The Keystone Telephone Company is to be congratulated upon securing Mr. Frewin's services.

THE STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY, Rochester, N. Y., and Chicago, Ill., recently closed a contract with the Southern Electrical Construction Company, of Huntington, Ind., for a 2,400 line full lamp signal central energy switchboard, with a present equipment of 700 lines for Bowling Green, Kentucky. The contract includes 700 telephones, a toll board, chief operator's desk and complete power equipment. Representatives of the above company were in attendance at the recent Interstate Telephone convention, at which time this contract was made, after inspecting the systems of the various telephone manufacturers. It is stated that this is the largest single contract closed during the convention.

The Stromberg-Carlson Company has also closed a contract with the Cherokee Telephone Company, of Tahlequah, I. T., for a 200 line capacity drop switchboard, and with the New Castle Telephone Company, of New Castle, Indiana, for 1,000 line capacity visual signal central energy switchboard, consisting of four sections; also a two-position toll board equipped with 40 lines.

PLANTS FOR SALE

Advertisements under this head \$1.00 for 25 words or less for each insertion. Prepaid.

FOR SALE.—One brand new Eureka 100-drop express switchboard and chair; one brand new 10-drop Standard switchboard; will guarantee them and sell at a bargain. Address A. C. SCRIBNER, 30 2d Ave., Gloversville, N. Y.

INVESTMENT OPPORTUNITY.—Telephone plant, 1 year old, 195 subscribers, 85 miles toll lines in booming town, 4,000; connections with Independent long-distance lines in view. Good reason for selling out. Address A, care of AMERICAN TELEPHONE JOURNAL, N. Y.

LEASE:—Wanted to lease telephone or electric light property, by practical, all around electrical man with some capital. Address CAPITAL, care AMERICAN TELEPHONE JOURNAL, New York.

WANTED

Advertisements under this head, 25 cents for 25 words or less for each insertion. Prepaid.

FORMER assistant exchange manager in charge of 2,900 subscribers, New York City, is open for position. Age 29, technical graduate, broad business experience. Address R. A. D., care THE AMERICAN TELEPHONE JOURNAL, N. Y.

WANTED—Sober, reliable young man as superintendent of 200 subscriber plant and outside work. Must be thoroughly competent in switchboard and instrument work of magneto and common battery system; hustler, capable of maintaining plant to highest efficiency, and know how to get best work from employes. Address, stating experience, references and salary expected, TELEPHONE, Lock Box 93, Elizabeth City, N. C.

POSITION WANTED by strictly temperate man, 25 years old, with seven years' experience in Independent and Bell systems. Experienced in all branches of work. References from former and present employers. South preferred. Address EXPERIENCE, care AMERICAN TELEPHONE JOURNAL, New York.

MANUFACTURERS: An engineer, experienced in designing common battery apparatus, and with excellent references, desires position with a good telephone manufacturing company. Address ENGINEER, care AMERICAN TELEPHONE JOURNAL, New York.

I WANT the exclusive handling of an account, for Chicago trade, beginning January 1st. Manufacturers' Agency basis. Address SALESMAN, care AMERICAN TELEPHONE JOURNAL, Monadnock Building, Chicago.

A HOME IN SOUTHERN CALIFORNIA—I desire to communicate with a man capable of taking charge of a factory for insulating rubber-covered National Code wires. This is a splendid opportunity for the right man. References given and required. No money necessary. Address P. O. BOX 1116, Los Angeles, Cal.



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